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ABSTRACT

The primary foci of this evaluation are the achievement gains of Title I students in reading and mathematics, the differences in the educational experiences of Title I and non-Title I students, the ways in which these differences may influence improvement in reading and mathematics, and the interaction between student characteristics and the differential effects of the Title I program. In addition to an executive summary, implications and recommendations, a program description, and an evaluation design summary, chapters on the following topics are included in this report: (1) teacher profile of the Title I child; (2) student reading and mathematics achievement; (3) self-concept; (4) Piagetian Conservation Assessment; (5) instructional process analysis; (6) special education; (7) private schools; (8) impact of individual and group variables on student achievement; (9) special programs; and (10) language assessment. Appended are a Language Assessment Battery, normal curve equivalents, and achievement score distributions. Also included is a bibliography. (Author/EB)

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EVALUATION OF THE ESEA TITLE I PROGRAM OF THE PUBLIC SCHOOLS OF THE DISTRICT OF COLUMBIA

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Helmuts Feifs

A. Jackson Stenner

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CHAPTER I

EXECUTIVE SUMMARY

Title I of the Elementary and Secondary Education Act of 1965 (Title I ESEA) authorizes grants to public education agencies to meet the special educational needs of children living in low income areas or in institutions for the handicapped, neglected, or delinquent. Children of migratory workers and American Indian children attending federal schools may also be served by programs established through Title I funding.Programs must provide educational and support services which are supplemental to the regular program offered by the public education agency, and payments are made to state educational agencies for grants to local education agencies.

The Title I Comprehensive Program of the Public Schools of the District of Columbia has operated under its present organizational structure since the 1972-73 school year. During this time the program has served 17,000 to 20,000 kindergarten, first, second, third, and seventh grade students. The rationale for emphasis on primary grade students reflects the program's philosophical committment to prevention. Seventh grade students were included in the program to facilitate transition between the elementary and secondary school levels.

The target population served by the FY 1977 program resides in the public school districts selected for Title I participation. It includes students who were identified as (1) achieving at or below the 50th percentile on national norms for either reading or mathematics, (2) repeating a grade, or (3) being two years older than normal age for grade. Kindergarten pupils were identified on the basis of a standard preschool inventory (CTBS, Form A). In the eligible private schools, approximately 600 students were served in grades one through eight.

The major goal of the Title I Comprehensive Program is to improve reading and mathematics skills of identified Title I students as measured by standardized achievement tests. Students participating in the program should achieve more in reading and mathematics than they would have had there been no program. The primary evaluation question is whether students achieve above the expected no-treatment level by an amount which is both statistically and educationally significant.

Although the level of student achievement in reading and mathematics is of central concern, several other questions were posed during the planning stage of this evaluation. Not all of the questions developed during the planning stages of this evaluation were answered. Low availability of data, incomplete data and noncomparable data made analysis for some of these questions impossible. Following is a list of these questions (* indicated no answer):

- What are the strengths and weaknesses in the reading and mathematics achievement subtest profiles for Title I eligible students compared with non-Title I students?
- What student characteristics are more predictive of reading and mathematics achievement (student characteristics: sex, age for grade, years in the Title I program, type of program, preschool experience, size of family, classroom behavior, physical health)?
- What teacher process dimensions discriminate between classrooms with the lowest adjusted norm-referenced reading achievement test scores and classrooms with the highest adjusted scores?*

- How do Title I students compare with non-Title I students in terms of self-concept development?

- Is there a causal relationship between achievement and conservation skills acquisition; if so, what is the direction of that relationship?*

- How may Title I students be characterized in terms of their language facility and communication ability?

- How do Title I students compare with non-Title I students in terms of language development?

At the policy level four questions serve to summarize the foci of this evaluation:

- Do students who have been exposed to the Title I program achieve more in reading and mathematics than would have been expected had they not participated in the program?

- In what ways are the educational experiences of Title I students different from those of non-Title I students?*

- If Title I students do, in fact, learn more than expected, and if the educational experiences of Title I students are different, then in what ways are these experiences related to improvement in reading and mathematics?

- Are there differential effects of the Title I program which interact with student characteristics?

The use of the norm-referenced model indicates that the D. C. Title I program in 1976-77 has a positive effect when the observed posttest achievement performance of Title I students is compared to their posttest no-treatment expectation.

The analysis of the achievement test scores on the comprehensive test of Basic Skills shows that Title I students have substantial gains during the school year. The gains were generally educationally significant when compared to the standard deviation of the Achievement score distribution of the norming group. The mean gains of Title I students in grades K-3 were between 3.26 and 11.06 NCE's. An NCE is the prescribed metric for reporting Title I Achievement results. Using an appropriate Office of Education evaluation model, any gain greater than zero demonstrates a treatment effect or program effectiveness. There are significant gains in mathematics in grades 1-3 and 7, and in prereading in grade K and in reading in Grade 2. The average achievement gains in mathematics for Title I students are generally higher than their gains in reading.

The examination of the Student Information Form (SIF) for the 1976-77 school year reveals some similarities with previous year's evaluation results, as well as some differences. Title I students are less mobile (as a group) than their non-Title I peers. Frequency of family support of school activities for Title I and non-Title I students is somewhat more prevalent among the non-Title I group.

Non-Title I students are definitely more likely to be characterized positively in perseverance, motivation, aggressiveness, and peer interaction on the SIF than are Title I students. The non-Title I group is also less likely in general to be referred for Pupil Personnel Services attention than the Title I group. The one exception is on the negative side of aggressiveness, where non-Title I proportions tend to be larger than Title I student proportions. Title I students are classified twice as often as non-Title I students as having "special needs."

Nonstandard English remains the leading contributor to educational difficulty, and is a communication pattern for *both* Title I and non-Title I groups; however, of those students described as

having this characteristic, 81% of them are Title I eligible students (due in part to the great disparity in the Title I *vs* non-Title I population proportions in the SIF sample). Title I students also seem to have more trouble with aural and nonverbal communication patterns.

The complexity of the developmental process which a child experiences in the early years of grade school is clearly indicated by the patterns of association between levels of cognitive development and a wide variety of personal characteristics, behavior patterns, and social factors. Because of the clear link between a child's level of cognitive development and the degree to which a child benefits from the educational process, the significance of the developmental process for both the child and for society as a whole cannot be denied. A child can assimilate only those aspects of the educational process for which he is prepared through previous cognitive development, and in order to ensure that the child's long term development is balanced and successful, the level and pace of the educational process should correspond to the stage of the child's cognitive development. The Conservation Assessment Package, a test which assesses student development on one dimension of Piagetian Theory, documents some remarkable diferences in the ages at which Title I and non-Title I students acquire certain important cognitive skills. Title I students are found to be one year behind their non-Title I peers on selected skills which may be prerequisite to advancing in reading and mathematics beyond the first grade level. One implication of these evaluation findings is that the achievement of Title I students may be due to responding to the educational process in an associative rote memorization style, rather than eductively integrating new material into the structure of what they have already assimilated.

The examination of the student's self concept indicates that in general the two most important factors associated with differences in self concept are the student's individual characteristics as reported on the SIF by his/her teachers, and the school which the student attends. The students' achievement test scores are almost as important as their individual characteristics and the school which they attend, and the students' grade level is always the least significant of the four factors. Within the context of the other variables used in this analysis, there are no significant differences in self concept that can be uniquely attributed to Title I program participation. There is a general decline in the level of Self Acceptance from grade one to grade three for both Title I and non-Title I students that parallels the general year-to-year decline in achievement scores. There is a remarkable growth in Social Maturity for both Title I and non-Title I students between grade one and grade three. Overall, the self concept profiles of both Title I and non-Title I students are reasonably close to the national averages, and the mean self concept scores are almost all within half a standard deviation of the national norm.

The analysis of the achievement test scores on the Comprehensive Test of Basic Skills shows that both Title I and non-Title I students have substantial percentile gains during the school year. An analysis of longitudinal data reveals that for both Title I and non-Title I students there are substantial losses in achievement percentile during the summer period. The total cumulative impact of academic year gains and summer losses is a progressive decline in overall score levels from spring to spring. The pretest score distributions of the Title I and non-Title I student groups were compared and found to be reasonably similar. The pretest score distributions of students in grade one are very close to a normal distribution. The grade one pretest means are found to be less than a standard deviation below the national norms. When Title I students were compared to non-Title I students with the same pretest achievement scores, non-Title I students generally showed a tendency to perform better on the achievement posttest. In order to explore the causes of this. the components leading to success in achievement were investigated. The two most important factors are the student's individual characteristics as reported on the Student Information Form, and the student's level of pretest achievement score. The components of success analysis suggests, however, that the total and combined impact of a student's school and its achievement and affective profile, the achievement and affective profile of the student's class, and the characteristics of the student's teachers and the teacher's instructional process, when taken all together, are more important in affecting the student's achievement outcome than the student's own pretest level of achievement, personal characteristics, and self concept.

The results of this evaluation indicate that teachers do benefit from the inservice activities that are held to further their professional development. Seventy percent of the responding teachers indicated that they have made some modifications to their classroom activities as a result of attendance at an inservice. Teachers and teacher aides indicated somewhat different levels of activity in the classroom with aides indicating a higher level of classroom activity than did teachers.

Principals on the whole were satisfied with the Title I program in their school and felt that the level of services was adequate. Principals indicated a strong desire to expand the scope of the program and serve more students by changing the criteria for participation.

Parents indicated that they were generally satisfied with the Title I program and they felt it was doing a good job in most areas. Some parental concern was noted, however, regarding the provision of health services to their children, and being informed about health services which were available. Parents also expressed some desire to change the location of the Parent Awareness conference and to expand its scope.

Resource teachers indicated that their students had problems mastering concepts and skills in reading and mathematics and that these difficulties increased or diminished by grade level. The reported difficulties of students are directly associated with the degree of abstractness of the skill or concept being taught. Whether these reported difficulties are a function of the teacher's teaching methods or the student's learning style is not clear.

The Special Learning Centers which serve students who have been referred to the learning centers for remediation of specific learning difficulties in reading and mathematics, met all their objectives for the 1976-77 school year.

CHAPTER II
RECOMMENDATIONS AND IMPLICATIONS

1. The process for identification of individual students for service by the Title I program needs refinement, standardization, and extensive dissemination at the school level. This conclusion is based on analysis of student achievement results, principal questionnaires, and student information forms which show unanticipated variance in the population selected for participation.

2. The basis for the current curriculum should be examined to ascertain whether its emphasis is on rote learning or a more educative curriculum. Converging lines of investigation during recent evaluations from several sources (e.g., Language Assessment Battery, Piaget assessment, and achievement instrumentation) suggest that it is largely rote in nature and it is possible that an educative curriculum may better meet the needs of the Title I student.

3. Student self-concept has increased in a positive direction overall. However, analysis indicates different forms of implementation of the teacher handbook. This should be investigated to determine elements which lead to positive and negative change.

4. Students are having noticeable difficulty in usage of standard English, as there are increases in use of nonstandard English with higher grade levels. Although no clear causality can be shown as yet regarding the relationship between nonstandard English and achievement, this area should be one of programmatic concern, such as developing inservice programs for teachers on language development and cognitive growth of students.

5. Results of achievement testing indicate that the Norm and Criterion Reference Test utilized for each student should be more appropriate to his functional level than to his grade level. Testing at the student's functional level provides a more accurate assessment of his achievement.

6. School principals generally expressed understanding of the selection process for and programmatic functioning of the Title I program, yet sufficient variance existed to suggest the need for a pre-Fall inservice program focusing, for example, in these areas plus different uses for the standardized achievement tests and scores received in their schools for the Title I students.

7. If out of level testing on the criteria referenced tests (reading and mathematics) is going to continue, then cross level norms for the tests should be developed so that test results from different levels of the test may be compared. It would also be advisable to develop locator tests so that the students can be administered a test level that is objectively determined to be appropriate for their level of achievement.

8. The investigation of the "Summer Loss" phenomenon should be given a high priority to determine what causes the progressive decline in achievement scores from year to year, in spite of substantial school year gains. Special attention should be given to student characteristics and background, student activities in the summer, and the educational process and content itself.

9. Because of the immediate and profound impact that the instructional process and environment have upon the student's success and achievement, these areas should be thoroughly and objectively examined. The responsibility for student achievement has been focused almost exclusively upon just the student. Even though students do play the major role in determining their own success, the significance of the educational process cannot be denied.

10. While the results of the STELLAR and CSSP program evaluations are essentially inconclusive, every effort should be made to encourage this kind of programmatic innovation.

CHAPTER III
PROGRAM DESCRIPTION

DESCRIPTION OF THE LEA

The District of Columbia has the fourteenth largest public school system in the United States. In the 1975-76 school year, it served approximately 130,685 elementary and secondary school pupils. At least 95.3 percent of these students were Black. Total enrollment figures, as in many other large LEAs, have been declining slightly over the past few years, as indicated by the following figures:

- In 1971-72 the enrollment was 142,805;
- in 1972-73, 140,000;
- in 1973-74, 136,532; and
- in 1974-75, it was 132,306.

Although there has been a gradual decline in enrollment, the demands upon the school system have been increasing. In November 1976, approximately 55 percent (39,927) of elementary school students, and approximately 41 percent (13,038) of junior high school students, were eligible for free lunch. Thus, a considerable increase in the strain on LEA financial reserves can be seen when these percentages are compared to those of previous years.

A study completed August 1972 indicated that 66 percent of the District's elementary school children live in attendance areas where the median family income is lower than the median family income of the District population as a whole. From this information it may be inferred that many of the students in Washington have special needs. These needs demand services that can be provided only with a considerable expenditure of funds. Not only has there been insufficient funding to cover such needs, but funding increments have not kept up with inflation. Naturally, this financial deficit hinders District administrators in the pursuit of their educational aims.

In the District of Columbia, the allocation of budgetary resources is initially determined by local governmental officials. After reviewing the total city budget, the Congress of the United States gives final approval to the annual expenditure for public education in the LEA. Initially, the LEA budget is planned by the Superintendent of schools, who then submits it to the Board of Education for approval. After study by the mayor and the city council, the list of projected expenditures for educational purposes is included in a final city budget, which is then presented to the President of the United States. Representing the President, the Office of Management and Budget revises the budgetary plan and then submits it to the Congress of the United States. After an examination by members of the House of Representatives, the Senate, and the Joint Senate-House Conference Committee, the Document is sent to both houses of Congress for final approval. It is ultimately examined by the President for his signature or veto.

In 1976, a sum of $1,746 was required to pay for the education of each student. Basically, the costs of the school system are borne by local monies; Federal funds, although helpful, are used only for special projects. Approximately 70 percent of the per pupil expenditure in 1976 was directed into teachers' salaries.

The administrative structure of the Public Schools of Washington, D. C., is unique. Due to the singular combined city-state status of the District of Columbia, state and local educational functions are very largely integrated. However, there is an organizational entity that functions as a state education agency (SEA). Through the SEA, the school system obtains and uses Title I and other grants. The SEA administers the Title I program under the auspices of statewide standards. It is responsible for formulating reports from information submitted by the local school district; these documents are then forwarded to the Office of Education. Suballocating grant funds to LEAs, assisting local school officials in the development and monitoring of projects, and approving proposal undertakings in accordance with Title I regulations and program guides are among the duties of the SEA. This office also maintains fiscal records for all grant funds.

Bearing the most direct responsibility for actual program operation, the LEA identifies "educationally deprived" children in low income areas and determines their special needs. This office designs and implements projects to meet the educational needs of identified children. It submits an application to the SEA for Title I funds. Fiscal records are maintained for all project funds, and reports to the state are forwarded on the use of such monies. The LEA attempts to keep a balance between project and nonproject area expenditures. It makes a vigorous effort to disseminate information regarding Title I projects to the public.

The District of Columbia has one Board of Education, consisting of eleven members, and one superintendent. Elected by the Washington citizens, these individuals take office on the fourth Monday in January for the initial phase of their four-year terms. The Board members for this entirely urban region serve "staggered" terms.

The Board chairman is entitled "President". His vice-president and eight of the eleven group members each serve a given ward in the District.[3.1] In effect, the superintendent works for the Board of Education, which can hire and fire him in accordance with its own judgments and needs. The superintendent is appointed by the Board for a three-year term. The present superintendent brings twenty years of educational experience to his position.

There are six educational regions in the D. C. public school system. Title I has collapsed two of these into a single unit. This means that there are five functional Title I regions in the District. The LEA has almost total control of the educational operation in Washington. Although the SEA has some right of approval, the state mainly provides the LEA with technical support and assistance. The LEA central agency is responsible for district-wide program control. Program assessment, management, dissemination, research, and evaluation constitute the critical functions of this administrative entity. The central agency is obliged to maintain uniformity of program quality, while interpreting and complying with district regulations, policies, and procedures.

In the five Title I regions, a system of decentralized support and assistance is provided to 80 local schools. The organizational aid is delivered by regional coordinating staffs. Faced with a plethora of responsibilities, these groups coordinate assessment of student and staff needs, mobilization of resources, evaluation of program effectiveness, implementation of intensive staff training, and dissemination of program information. Regional staff members aid in supervision and management of program operations in local schools. The maintenance of a record-keeping system, which includes documentation of requests and delivery of services, is also the obligation of the regional team. Through the regional breakdown concept, the individual needs of given Title I project sectors are met.

Washington students are served in 134 elementary schools. These are complemented by 30 junior high schools and 12 senior high schools. Two of the senior units are citywide programs. Five vocational high schools supplement the normal senior high program. With a predominant grade breakdown of one to six for the elementary institutions, seven to nine for the junior, and nine to twelve for the senior high schools, Washington is in accord with the national organizational norms. The majority of the schools use the self-contained classroom structure.

Standard educational programs are reinforced by comprehensive special education, career development and continuing education plans. During the 1974-75 school year, 13,038 students received special educational help. Services were provided for students with physical, emotional, or intellectual handicaps. Accelerated classes were planned for gifted students. Currently, a primary aim of the special education training is to retain the student in the regular classroom setting, while needed assistance is provided by specialized personnel. A free and reduced price meal program provides nutritional as well as moral support for younger students in standard classes.

Although there are no bond issues in the LEA, community support is manifested by support for a P.T.A. organization, which is directed from a central Washington office. A local Home and School Association functions in buildings that do not have their own P.T.A.s. Most of the projects organize parent advisory councils, which also provide forums for parent-teacher interaction.

PROGRAM DESCRIPTION

Since its initiation in 1966, the Title I program has undergone major transformations. In 1967-68, the number of identified students reached a high of 70,000, and in 1971-72 it reached a low of 14,300. The number of active schools has also shown fluctuation. In the 1970-71 term, there were 34 Title I schools. In the 1967-68 school year, 95 schools were involved in the program. In fiscal year 1976, 63 elementary, 16 junior high, and 6 nonpublic schools received Title I funds in the District of Columbia. There were 17,000 participating students who obtained the benefits of a grant of $17,691,492.

In the public schools, grades kindergarten, 1, 2, 3, and 7 were served. During fiscal year 1977, 64 elementary and 16 junior high schools received monies to support programs in these same grades. In nonpublic schools, during 1976-77, funding aided Title I students in grades 1 to 8. For selected fourth grade students, special extension services were provided. These involved reading and mathematics resource laboratories. A preschool expansion plan called for the provision of instructional services, materials, staff development, educational aids, and curriculum support for pilot prekindergarten classes in 29 schools.

Designed to enhance learner achievement, the major goal of the ESEA Title I program for fiscal year 1977 was to improve the reading, mathematics, and affective skills of identified Title I students. The cognitive thrust of the plan is well defined. Given seven months of instruction in the Title I Total Learning Center, identified students will show definite improvement in their achievements. Hopefully, the mean differences between the scores in reading and mathematics for Title I and non-Title I students will not be as great in the spring of 1977 as in the fall of 1976. In order to decrease the need for remedial help in the upper grades, Title I students from grades K-3 and 7 will ultimately be expected to perform close to the norm for large metropolitan areas. Naturally, it is a programmatic objective to help as many students as possible grow away from the need for any Title I aid at all.

Having received the benefit of seven months of exposure to the Title I learning center, students will show observable, positive change in their affective behavior. This improvement will be noted by teachers, noninstructional personnel, and parents. An important aspect of the improved behavior will be manifested in an increased interest in and greater enthusiasm for learning. Students will relate to their peers with greater facility.

Identical to those used in 1976, the criteria for the selection of valid ESEA Title I attendance areas were originally recommended by the program's Citywide Advisory Council. These standards had been approved by the Board of Education in June 1975. The two vital factors in choosing an attendance area were family income and the number of children eligible for free lunch. In terms of importance, the income factor was given a 60 percent and the free lunch a 40 percent weighting. Further details of the selection method may be found in the handbook for local Title I officials, *Title I ESEA, Selecting Target Areas.*

Eligibility for individual children in both public and nonpublic schools depends on their places of residence being in a designated attendance area. Also, they must fall at or below the fiftieth percentile on a nationally normed standardized test. Students from grades K-2 take the *California Achievement Test.* Students in the third grade take the *Comprehensive Test of Basic Skills* Level I; those in the seventh grade take the *Comprehensive Test of Basic Skills,* Level II. In all the schools, students who repeat a grade and those who are two years or more older than the accepted age for a grade are eligible for Title I help. In the latter case, the learner's entry into the first grade should coincide with the child's sixth birthday.

Previous to the study of the Title I curriculum, it is essential to review the stated needs of the eligible students. In 1975 these needs were summarized in a manner that allowed the Title I administration to formulate certain programmatic objectives. These involved attempts to raise achievement levels of identified Title I pupils in reading and mathematics, help students develop positive self-concepts and enhanced hopes for professional success, and provide appropriate counseling and guidance. The counseling sessions were designed to inform students about such diverse areas as

health, economic need, absenteeism, and domestic problems. It was explained that comprehension of many and varied nonacademic subjects is often subtly related to the knowledge that may be obtained in the classroom. A primary parental aim called for parents to assist teachers to improve their skills in using the diagnostic-prescriptive approach to meet individual pupil needs in reading and mathematics. Teachers were asked to encourage active involvement of parents and other interested citizens in the decision-making areas of the instructional program at the local school and central office level.

The fiscal year 1977 Title I program includes a curriculum balanced in a manner that will allow it to deal with the cognitive, affective, and psychomotor development of each child. Since it has been established that a child's motor functioning is related to cognitive, emotional, and linguistic growth, strategies have been designed to encourage an interlocking pattern of physical and intellectual development. To develop certain cognitive powers, students begin by listening for different sounds. They observe, compare, and analyze their perceptions. In a more sophisticated, dramatic situation, analytical skills might be developed through the learner's use of pantomime or storytelling. To improve skills in oral communication, reading, and writing, students are encouraged to use vivid, descriptive words; listen to stories; and write experience charts. Exposure to nonverbal rhythm activities and alternative methods of communication is related to the development of total linguistic power. The emphasis on development of a positive self-concept is indicated by attempts to help students respect their own physical being. The student is also encouraged to interact with adult and peer groups and to cope with various problems relating to social interaction. Any strong point in the learner's performance is used to encourage the development of a total pattern of abilities. As an aid to implementation of program activities, the Title I curriculum committee provides a *Handbook for Teachers* for project staff.

Any comprehensive educational plan which emphasizes a multisensory approach will depend heavily on extra school activities such as field trips. In the Washington area, the list of possibilities for these trips is truly imposing. Students may visit King's Dominion, the Air and Space Museum, the Museum of Natural History, and Rock Creek Park. The White House, Judiciary Building, Bureau of Engraving, Smithsonian Institition, African Art Museum, and the Jefferson Memorial provide inviting visitation sites. To appeal to the appetite for entertaining and interesting instructional situations, trips are organized to MacDonald's Farm, the National Zoo, Wheaton Regional Park, Hines Chick Hatchery, Oxon Hill Farm, Storybook Land, and the Wax Museum. Students are also exposed to a puppet theatre, instrumental jazz string quartet, library theatre, sing-outs, magic shows, and marionette shows.

Anne W. Pitts, Executive Director of the Title I Program, on May 12, 1977, described the "Title I Exemplary Project" for the first, second, and third grades. A study of this description reveals the key concepts in the curriculum development plan for the project. The organizational response to the needs of the educationally disadvantaged students was a multifaceted presentation strategy, which included two instructional interventions and specific pupil and staff supports. The interventions included a comprehensive reading and mathematics resource center and a supplementary classroom program placed in each target school.

Student academic and learning support needs were added to their scholastic assets and strengths to form a conceptual target for Title I intervention. The Title I influence affected the standard curriculum through staff instruction, which was organized and focused by LEA administrators and culminated in changes in student outcome.

Critical to the project infusion process was the Reading and Mathematics Resource Center program. Providing supplementary instruction for a selected group of students, the center was located in a designated area of each participating school building. Student need was judged according to two basic criteria. The first was percentile ranking on the reading and mathematics subsets of the standardized achievement test. The second included severity of academic deficiency, rate of learning, and demonstrated classroom performance as assessed by school staff.

For the first, second, and third grade learners, an annual average of 160 students was served in each center laboratory.[3.2] Small groups of eight to ten students received supplementary instruction for

thirty-minute periods, three times weekly. Learners were placed in appropriate groups according to common skill needs. The size of the Title I population in each given school determined its eligibility for a reading and mathematics resource center for grades kindergarten to three. If the pupil population was at or below 100, the reading and mathematics laboratories each received one teacher and one aide. Schools with between 100 and 200 or 300 learners also were allowed a teacher and an aide for each laboratory. Schools with between 300 to 400 or 400 to 500 students obtained the help of two teachers and two aides in the reading and mathematics laboratory.

For schools that conducted a combination reading and mathematics laboratory, one teacher and one aide were the assigned staff. Reading study actually encompassed work with various linguistic and speech problems. On the seventh grade level, laboratories were staffed by one teacher and two aides. Student group size never exceeded 200.

The role of the reading or mathematics resource teacher was divided into three components. Those called for curriculum planning and the subsequent education of Title I students; teaching assistance in reading or mathematics to classroom teachers of identified Title I students; and staff development for classroom teachers, Title I educational aides, and Title I parents. Combination teachers provided supplementary instruction in reading and mathematics in schools with a small Title I student population.

Curriculum offerings for the resource centers emphasized individualized instruction and prescribed learning experiences and activities in reading and mathematics. The immediate focus was on skills development, "decoding," reading comprehension, dealing with receptive and expressive language, and understanding mathematical concepts, computation, and applications. Mathematical study implied a strong emphasis on problem-solving, but this concept also applied to reading exercises. Using diagnostic-prescriptive approaches, strategy implementation was designed to achieve criterion-referenced objectives. Programmatic planning and skill mastery were both subjected to carefully organized record-keeping.

Calling for a carefully planned activity schedule, the individually prescribed instruction procedure was based on a posttest for mastery. Prior to this examination, a skill need was identified and an objective was selected. A learning prescription was written and implemented. If the posttest was passed, the process was repeated in terms of a fresh objective. If the posttest was not passed, the learners again attempted to master the initial concept.

As a component in the infusion effort, the classroom program provided instruction that was supplementary to the standard activities. This instruction was offered in 30-minute blocks. Continuing the resource center emphasis on language and mathematics skills, the classroom activities dealt with three basic concerns. These were language facility, concept development, and self-concept. To build strength in reading, curriculum offerings encouraged students to respond to literature, select their own reading materials, compose written stories, and investigate language patterns.

The mathematics programs were highly dependent on manipulative devices. Course emphasis was gradually shifted from the concrete to the semiconcrete and, ultimately, to the abstract dimension. Traditional to the Washington Title I programmatic effort to teach mathematics, the mathematics manuals offered a wealth of suggestions for simple experiences with objects, activities, and games. Measurement and graphic concepts were related to appropriate objects to enhance the student's ability to draw the indicated mathematical conclusions, as revealed by the instructor. Varied photographic effects and puppet shows held student interest, while emphasizing the multidimensional quality of the real world.

Also generally useful to the classroom teachers, the *Title I Handbook* was an interdisciplinary curriculum resource instrument. It provided a wealth of ideas for lively instructional exercises. *Mini Things by Mini People*, written and illustrated by Washington, D.C. Title I students from the primary grades, was used to encourage independent reading, student interaction, adult-student interaction and general learner motivation. This anthology of eight booklets is composed of stories, poetry, music, and art work. Illustrating the imaginative skill and creative vision of the involved urban students, the

series served as a vehicle to encourage peer sharing and student expression through the written word and the visual arts. *Mini Things by Mini People* was a strong catalyst to the building of positive self-concepts and enhanced independent reading schedules for those students who were involved in its production or exposed to its literary products. Approved by the Board of Education, the anthology was initially disseminated in September 1976.

Complementing the resource center and classroom program, two new pilot plans are being integrated with the older Title I schedules. Closely associated with the resource center offerings, the first of the new plans, the Collaborative Saturated Service Program (CSSP), is designed to bombard the student with Title I learning activities to avoid plateaus or regressive trends in learning.[3.3] The CSSP attempts to embellish the incumbent instructional program, while ministering to many of the needs that are manifested in the learner's total behavior pattern. Components of the CSSP effort are cultural enrichment, parental involvement, pupil personnel services, and health services.

The objectives of the CSSP infusion endeavor demand that third grade students demonstrate marked changes in learning ability after a four-month block of extensive programmatic exposure. Learners must show a mean performance gain better than one month's growth in reading and mathematics achievement for one month of instruction, as indicated by a standardized achievement test. Also, the third grade participants will reveal a mean performance gain between January 1977 and May 1977 superior to the mean gain shown by the same students between September 1976 and January 1977. Hopefully, the four-month exposure period will cause an increase in positive affective behaviors that will be verified by the classroom teacher.

Staff development progress, as well as learner achievement, is judged in terms of four month blocks. Given four months of staff development activities, resource teachers, classroom teachers, and educational aides will demonstrate competencies in identified areas of the instructional needs of third grade students. The aforementioned competency will be documented by appropriate supervisors.

In the areas of attendance, clothing scarcity, health needs, and psychological and social help, as evidenced by services rendered and action accomplished, teams will demonstrate effectiveness in providing for the identified needs of Title I third grade students. As evidenced by remediation and follow-up services, health aides will demonstrate effectiveness in delivering medical support services. Given four months of staff development and systematic involvement in the Title I program, 75 percent of the parents of third grade students will render needed parental support services. This will be evidenced by documents of selected observers.

The second of the new pilot programs, STELLAR stresses "strategies and training for effective learning in language and reading." Painstakingly comprehensive and well-planned, STELLAR strikes at the weakness in the standard Title I program for students in the first, second, and third grades. As with the CSSP program, efforts to help students are organized in four-month blocks. After this time lapse, the STELLAR effort requires 50 percent of the Title I students to master 70 percent of the prescriptive reading skills, as measured by a criterion-referenced test in reading. On the average, the percentage of mastery of prescriptive reading skills by Title I students in the STELLAR project will exceed that of a comparison group of Title I students in regular Title I reading laboratories. Statistically significant differences will again be measured by a criterion-referenced test in reading. Training also encourages progress in developing expressive language skills and an improved self-concept. Results are determined by STELLAR reading teachers and aides.

STELLAR staff development schedules allow eight months for training. Following this time lapse, "STELLAR Project reading-language teachers will demonstrate 18 competencies for providing effective instruction in reading and language for 'at risk' Title I students, as determined by trainer-developed assessment activities and verified by trainers, and regional coordinators."[3.4] STELLAR educational aides must perform in accordance with the same objectives as the project teachers. With eight months of indoctrination, parent trainees are expected to show a continually improving comprehension of methods of reinforcing student's desires to learn. This improvement is determined by a self-administered assessment instrument.

Each STELLAR center is staffed by a four-member team, which includes two full-time teachers, a reading-language teacher, and an educational aide. This team is supported by two part-time educators, a program assistant, and a parent assistant. Responsible for the individual reading and language program of each student, the reading-language teacher supervises the administering of individually prescribed instruction. This person controls educational diagnosis, selection or formulation of instructional objectives, learning prescription planning, instructional implementation, and instructional assessment. As leader of the center team, this person is responsible for coordinating its efforts in effective and appropriate educational interventions, interpersonal interactions, and the delivery of educational services.

The educational aide assists delivery and assessment of educational services for Title I students. This person must spend eighteen hours each week giving direct instructional assistance to students. Selected through a joint effort by the deputy director and the regional coordinators, the reading-language instructor must have a strong knowledge of relevant subject matter, effective teaching skills, flexibility in teaching style, a strong ability to establish rapport with others, and a demonstrated desire for professional growth. Instructional strategies are constructed around a basic "learning for mastery" formula.

For the primary staff development project component, the goal was to "provide all levels of staff and parents with the knowledge, skills and attitudes needed to effectively plan, implement and assess 'balanced' curriculum offerings to achieve reading and mathematics improvement."[3.5] Exposed to the training are central office Title I, regional administrative and supervisory Title I, regional resource, school administrative, and school Title I resource staff. Title I educational aides, parent assistants, and program assistants obtain staff development training. Also involved in the exposure are Title I pupil personnel workers, aides, clinical psychologists, and psychiatric social workers. Parents and classroom teachers of identified students regularly receive instruction in Title I concepts.

Training activities include workshops, study sessions, symposiums, demonstrations, seminars, lectures, and research proficiency sessions. Although staff development phases or topics address singular, critical facets of the curriculum design, each item must necessarily overlap and interlock with the others. Emphasis on each component will be decided by local school officials.

Phase I of the training deals with planning, which is, by itself, critical to the total progress of the project. In the planning stage, the annual programmatic scheme is formulated. The number and types of needed consultation services, additional resources, amount of time to devote to topics and subtopics, use of school and after-hours, kind and number of participants, and the methods of improving the organizational structure are all studied. In Phase II, the background and development of major theories and practices in education are communicated to the staff. Participants are introduced to the current theories and practices that affect classroom teaching strategies. Participants analyze the development of various methods for presenting ideas to students.

Phase III, which is concerned with the study of the philosophy of education, is divided into three conceptual sections. Section A deals with an analysis of the major philosophies used in modern public educational institutions; section B concerns assisting the growing teachers to articulate and construct their own educational philosophies; and section C encourages the staff members to mesh their personal educational concepts with those they have assimilated in previous investigations and training.

Phase IV of the Title I orientation procedure involves project teachers in the formulation of curriculum. Now, teachers directly confront the problem of constructing an operative, viable curriculum plan. In Phase V, which absorbs a great amount of the teacher's time, this plan is implemented. At this point in the orientation process, instructors use their previous training to help them solve problems involving controlling the learning environments, relating to the learner, contributing to the instructional team, channeling appropriate resources into the classroom, and refining their personal strategic approaches to teaching. Primarily concerned with assessment, Phase VI sees the teacher involved in asking and answering sweeping questions regarding the validity and effectiveness of the total Title I training concept.

To provide a broad teacher exposure to the staff training, approximately four hundred teachers will obtain eighteen days of release time with the appropriate substitute teacher help. Closely related to the standard training of the Title I teachers, the exposure of the instructors in the pilot programs, naturally, does have some significant differences. Emphasizing dealing with "at risk" students, STELLAR teacher training aims at a modular development of attitudes, background knowledge, and understanding. Staff development for CSSP teachers stresses the clarification of rules and strengthening of competencies that will relate specifically to the teacher's particular subject area. New approaches and techniques are defined. These should accelerate the successful achievement of CSSP goals and objectives.

The offerings of the Title I program are aimed at the student through the balanced curriculum. To develop conceptual abilities, language ability, and an improved self-concept, activities such as reading and listening to stories, game playing, and the plethora of enrichment experiences that previously have been mentioned are used. With the help of the *Handbook for Teachers*, commercial materials, and other aids, teachers lead students to an enhanced awareness of their abilities for creative thinking and sensory capacities. Manipulative kits, trade or library books, periodicals, paperback books, classroom libraries, games, and multimedia materials are key tools in the teacher's effort to construct a learning situation. Classroom, laboratory, reading resource, school-based, and itinerant teachers are supported by educational aides, paraprofessionals, parent volunteers, pupil personnel, Title I staff in general, and other students in a coordinated teaching endeavor with the Title I learner as its central concern. A strong laboratory program and individualized instruction support the structured classroom curriculum. The entire Title I program is cooperatively striving to bring the learners to the point in their academic development where they not only appreciate but actually commit themselves to the idea behind Thoreau's question "How many a man has dated a new era in his life from the reading of a book?"[3.6]

FOOTNOTES

[3.1] *Data Resource Book*, (Washington: 1975-76), p. 7.

[3.2] *Exemplary Project Public Schools Of The District of Columbia*, (Washington: 1977), p. 3. Attached is a memorandum signed by Anne W. Pitts and dated May 12, 1977.

[3.3] "A Guide to the Collaborative Saturated Services Program," p. 1.

[3.4] "A Guide to the Implementation of the STELLAR Project for 'at Risk' Title I Students," p. 11.

[3.5] "ESEA Title I Program, FY 1977," p. 30.

[3.6] Henry David Thoreau, *Walden* (New York: Random House, 1950), p. 97.

CHAPTER IV
EVALUATION DESIGN SUMMARY

The 1976-77 Washington, D.C. Title I program manifested the results of three years of a continuing longitudinal analysis. The evaluation questions presented in this document were formulated during a series of design conferences involving Title I staff, Division of Research and Evaluation, State Office, and district school personnel. Although the evaluation was performed under contract by an external agency, the design and implementation of this third year evaluation were, in every sense, a collaborative effort. The Division of Research and Evaluation provided input and assistance in virtually every aspect of the evaluation, from the initial design and conceptualization to the critiquing of drafts of the final product. This chapter provides an overview of the general design strategy; reviews the salient milestones; and lists the evaluation questions, instrumentation, and sampling considerations in this evaluation.

DESIGN STRATEGY

The conceptual underpinning used in this evaluation is the Information Based Evaluation (IBE) [4.1] model, which recognizes that the primary objective of evaluation is supplying useful information to individuals in decision-making roles. The IBE strategy focuses on evaluation questions and the ways in which these questions can be most usefully answered for different audiences. Built into the IBE model is a training component which introduces program and project staffs to the rationale and procedures for designing, implementing, and adjusting an evaluation design. The training, which takes place through the medium of design conferences, is introduced at points throughout the project cycle and precedes the times at which the project staff is actually involved in implementing designated aspects of the evaluation design process.

The IBE model relies heavily on the interaction among the needs of the evaluation team, potential information users, and project staff. Perhaps the most effective vehicle for facilitating this interaction is the design conference, where the information users begin to identify their informational requirements. The design conference results in a more accurate picture of user needs and provides the participants with a sense of ownership in the evaluation process.

Information-based evaluation should not be considered as objective-free evaluation; the first procedure recognizes the importance of program objectives, but only to the extent to which feedback on the objectives is considered necessary to information users. The overriding consideration here is the type of question to which the involved individuals desire answers. Priorities are established in both an information domain category, such as reading achievement, and an information user category, such as the Title I program staff. The evaluation resources are then expended to meet these identified requirements. An additional check on the adequacy of evaluation information is the extent to which it leads to action. If no relationship exists between information and action, then the adequacy and quality of the evaluation effort are in doubt.

In polling the various information users, the evaluation team can often develop evaluation questions which relate to unintended outcomes or shadow benefits. These questions occur because all information users are probably not supportive of the program procedures and objectives; thus, their information and needs will highlight aspects of the program which would not receive attention in an objectives-based evaluation effort. Program developers and program staff generally have a well-developed commitment for the program and could be myopic in viewing the outcomes of the program. The possibility that the program may cause some unintended side effects could be very difficult for them to comprehend, let alone accept. However, individuals or factions that have been supportive of the program from the start are generally more than willing and able to identify potential weaknesses and unintended outcomes. Therefore, in serving each information user, the evaluation team can gain a balanced view of the program.

Information-based evaluation recognizes that an evaluation must be dynamic if it is to be responsive. Program objectives rarely change during the project year; thus, an objectives-based evaluation tends to be static in responding to the information requirements. Information-based evaluation accepts the fact that information needs are fluid, and new questions are posed as they arise throughout the program cycle.

By definition, a compensatory education program will possess characteristics that differentiate it from other educational practices. These characteristics are the ingredients in the program's recipe. If the recipe can be explicitly formulated, then it is likely that it can be replicated. More often than not, however, a program is judged successful in terms of the student outcome data, while the staff does not have the faintest idea of which dimensions of the program were responsible for success. Identification of the components or ingredients of program success is the goal of process/product evaluation.

Evaluators, in contrasting educational programs and classrooms, often identify their most distinguishing characteristics, and subsequent successes and failures are attributed to these programmatic features. For example, two compensatory education programs may be distinguished as "phonic based" as opposed to "sight based." The designators phonic and sight are accepted as sufficient for program comparison, despite the fact that there are undoubtedly dozens of more subtle differences (dimensions, strategies) among the approaches which are potentially more descriptive. Futhermore, the ways in which the approaches are alike receive little if any attention. The failure to go beyond simplistic, nominal designators or program descriptors contributes substantially to our inability to maximize the benefits of evaluation.

The IBE model addresses three primary classes of information and evaluation activity:

- Product (summative) evaluation.
- Process (formative) evaluation.
- Process/product evaluation.

Product evaluation assesses program outcomes; process evaluation monitors strategies and procedures designed to change student or teacher behavior; process/product evaluation explores the relationships among products and processes. Process/product evaluation seeks to determine which strategies in a particular program lead to desired outcomes and how these strategies can be replicated. Although often ignored, process/product evaluation is programmatically more useful than either product or process evaluation to decision makers.

In terms of questions to be answered, product evaluation asks: "How are the students or teachers different after exposure to the Title I program?" Process evaluation asks: "What strategies differentiate the Title I program from traditional approaches, and were these strategies implemented?" Process/product evaluation asks: "What are the relationships among the strategies and the outcomes of the Title I program?"

Process/product evaluation is important because managers need to know *why* a program worked just as much as they need to know how successful it was. The first and most difficult step in process evaluation is to decide what strategies are being implemented, which discriminate a Title I activity from a comparison activity.

MAJOR MILESTONES

An important aspect of the IBE method of design is the growth in evaluative sophistication of the client. This comes about as a result of the close client-evaluator interaction, which is an important part of the method of IBE evaluation design. The first design conference was held on December 10, 1976, at the Title I office. The conference covered a wide range of topics concerning the 1977 evaluation. In attendance were members of both the Title I staff and the Division of Research and Evaluation.

The design session involved a presentation of the 1976 Title I evaluation results, as well as topics to be covered in the 1977 evaluation. The Title I staff discussed, in terms of priority, questions that they desired to be covered in the 1976-77 evaluation.

The single most important factor to emerge from the design session, which subsequently established the tone of this year's evaluation, was the designation of a committee to review evaluation instruments that were to be used in the project effort. The progress of this year's evaluation depended largely on the great amount of work that was conducted by the committees, which were convened to address the requirements of their various Title I component evaluations. It was the task of these committees to review the evaluation of the past two years and to question the utility of the blocks of information and numerous methodologies that were employed in conducting these studies. This effort was carried out with dispatch and professional integrity. The data acquisition phase of the evaluation was completed by the end of June. All instruments were reduced to computer compatible form by the end of August, 1977. The evaluation team was very pleased with the return rates, accuracy, and completeness of the instrumentation procedure.

EVALUATION QUESTIONS

The following list of questions was given attention in this year's evaluation:

- What are the strengths and weaknesses in the reading and mathematics achievement subtest profiles for Title I eligible students compared with non-Title I students?
- What student characteristics are most predictive of reading and mathematics achievement (student characteristics: sex, age for grade, years in the Title I program, type of program, preschool experience, size of family, classroom behavior, physical health)?
- What teacher strengths and weaknesses are indicated by the process evaluation, and what inservice activities are suggested?
- What is the relationship between gross and fine motor skills development and both reading and mathematics achievement and self-concept development?
- Is there a causal relationship between achievement and conservation skills acquisition; if so, what is the direction of that relationship?
- How may Title I students be characterized in terms of their language facility and communication ability?
- How do Title I students compare with non-Title I students in terms of language development?

At the policy level four questions serve to summarize the foci of this evaluation:
Do students who have been exposed to the Title I program achieve more in reading and mathematics than would have been expected had they not participated in the program?

In what ways are the educational experiences of Title I students different from those of non-Title I students?

If Title I students do, in fact, learn more than expected, and if the educational experiences of Title I students are different, then in what ways are these experiences related to improvement in reading and mathematics?

Are there differential effects of the Title I program which interact with student characteristics?

INSTRUMENTATION

To a large measure, the outcome of a good evaluation depends on the quality of the instruments that are used to gather data. All the instruments utilized in the evaluation of the Title I program (1976-77), except for the *Comprehensive Test of Basic Skills* (CTBS) and the criterion-referenced tests, were developed or selected with a working involvement of the Title I program staff, teachers, parents, and research and evaluation staff. Each instrument used in the 1976-77 Title I evaluation is identified and briefly described in the following text. The instruments have been divided into: (1) student, (2) educational staff, and (3) administrator and participant categories.

Student Instruments

There were seven instruments utilized in collecting student information in the D. C. Title I evaluation. These were:

- *Language Assessment Battery* (LAB).
- *Self Observation Scales* (SOS).
- *Student Information Form* (SIF).
- *Conservation Assessment Package* (CAP).
- *Comprehensive Test of Basic Skills* (CTBS).
- *Criterion-Referenced Prescriptive Mathematics Test* (PMT).
- *Criterion-Referenced Prescriptive Reading Test* (PRT).

These seven instruments together measure three domains of interest: demographic, affective, and cognitive. Each will be briefly discussed in this section.

A new component of the 1976-77 evaluation was the addition of the *Language Assessment Battery* (LAB) for the assessment of the language facility of the Title I child. The instrument was developed by Ms. N. Blyth Riegel and staff from NTS and Dr. Juanita Fletcher, a consultant, with guidance from members of the Title I and Research and Evaluation staffs. The instrument called for recording and assessing qualitatively a selection of each student's speech patterns, plus an assessment of that student's ability to recognize common visual and auditory symbols that might be found in a given environment.

The *Language Assessment Battery* (LAB) is designed to assess the language and communication facility of the Title I students. The battery addressed both verbal and nonverbal areas and concerned itself with stimuli, which are received and emitted in order to communicate with others in a given environment. The LAB is comprised of the following eight sections:

- Environmental Sounds.
- Story Comprehension.
- Pictorial Symbols.
- Physical Symbols (Gestures).
- Words Beginning with "M."
- Picture Stories.
- Behavioral Checklist.
- Fletcher Checklist.

All of these scales are described in detail in Chapter 14, "Language Assessment."

The *Self Observation Scales* (SOS) are used to measure self-concept at each grade level. This is a nationally normed, group administered instrument with four levels: Primary, Intermediate, Junior High, and Senior High. With one exception, each level incorporates the subscales of its predecessors and includes additional ones as well. The primary level of the SOS is appropriate for the K-3 students in this evaluation. It has four dimensions:

- Self-Acceptance.
- Self-Security.
- Social Maturity.
- School Affiliation.

The intermediate level of the SOS is appropriate for the grades 4-6. Three additional dimensions are measured on this level of the SOS, and one scale (Social Maturity) is replaced by another scale (Self-Assertion). The junior high level (grades 7-9) scales, Form C are listed as follows:

- Self-Acceptance.
- Self-Security.
- Social Confidence.
- Self-Assertion.
- Peer Affiliation.
- Teacher Affiliation.
- School Affiliation.

All of these scales, both primary and junior high level, are described in detail in Chapter 7, "Self-Concept Development."

The *Student Information Form* (SIF) is designed to collect information from teachers about individual students related to background, home environment, and other essentially nonacademic and demographic factors.

The *Conservation Assessment Package* (CAP) is designed to assess relation perceiving ability among preschool and early school age students. The package is among the few theory-based measurement devices available for use with children. The instrument itself is founded upon Jean Piaget's systematic developmental theory of ability and structure, depicting the step-by-step thinking process of children. The package measures the concept of conservation as applied to two-dimensional space, numbers, continuous quantity, substance, and weight. This construct represents a pivotal point in a student's cognitive transition from the preoperational phase to a concrete operations stage.

Each of the subscale objects is presented to the child, who is then asked whether they are identical and why. For example, two rows of either paired or unpaired checkers are used to assess both conservation of number and the concept of one-to-one correspondence. Conservation of two-dimensional space is tested with several paired arrangements of wooden blocks, sometimes identical in number within each group and sometimes not. To test for conservation of continuous quantity, equal or unequal amounts of popcorn kernels are poured into plastic tumblers and compared; the contents of one of the tumblers is then poured into a plastic plate, and tumbler-plate comparisons are made. Conservation of mass is tested with two equal balls of clay, one of which is rolled into a cylinder. Clay balls are also employed in a similar fashion to test conservation of weight.

The *Comprehensive Test of Basic Skills* (CTBS) is a group administered series of achievement tests for kindergarten through twelfth grade students. In this evaluation Form S, Level A was administered to kindergarten; Level B, to first graders; Level C, to second graders; Form T, Level 1, to third graders; and Level 3, to seventh graders. The CTBS achievement battery is designed to measure systematically those skill areas which the publisher believes to be prerequisite to effective studying and learning in school.

The CTBS/S series for kindergarten pupils is comprised of three basic skill areas: prereading, language sets, and mathematics. The prereading subtest included Letter Forms, Letter Names, Listening for Information, Letter Sounds, and Visual Documentation. The language subtest is entitled Language, and the mathematics subtest is entitled Mathematics.

The CTBS/S series for grade 1-2 pupils assesses three basic skill areas: reading, language arts, and mathematics. The reading subtests include Vocabulary, Comprehension, and Total Reading; the language arts subtests involve Language Expression, Spelling, and Language Mechanics. Mathematics subtests are Computation, Concepts and Applications, and Total Mathematics.

The CTBS/T series for third and seventh grade pupils is comprised of five basic skill areas, but for this evaluation only reading, language arts, and mathematics were administered. The reading sub-

tests are Vocabulary, Comprehension, and Total Reading; language arts subtests are Spelling, Language Mechanics, Language Expression, and Total Language; mathematics subtests are Computation Concepts, Applications, and Total Mathematics.

A criterion-referenced test is designed to determine the state of an individual student with respect to the curriculum objectives for specific grades. All items in the tests directly correspond to definite curriculum objectives. The test results are reported in terms of mastery or nonmastery of each objective represented therein. The *Prescriptive Reading Test* (PRT) and *Prescriptive Mathematics Test* (PMT) constitute a group administered series of criterion-referenced tests for kindergarten through twelfth grade students. Both instruments have seven levels. A different test form has been developed to correspond to skills for grades one through six. For reading ability, one test has been developed for grades seven to nine. Each teacher had the option to administer those levels of both the PRT and PMT which most nearly matched the individual student's anticipated instructional ability in both skills. For example, a teacher with a class designated as fourth grade might wish to test five children with Level C in Reading, eighteen with Level D, and two with Level E. In mathematics, on the other hand, the decision might be to test twelve children with Level C, twelve with Level D, and one pupil with Level E.

The results for each student are reported with respect to mastery status for all the skills occurring at a specific level of the test. Each individual student's report is divided into major sections of broad cognitive areas under which are listed abbreviated descriptions of the objectives measured. For each objective there is either a plus (+), indicating that the pupil has mastered that skill, or a minus (−), indicating that the skill has not been mastered at the time of testing. If the student did not answer the items related to a skill, the report will show a blank for that student on that skill. Both the number of items correctly answered and the number of items by which the skill was measured are listed under each objective.

The intent of the student mastery report is to provide the teachers with significant diagnostic information, which should be helpful in planning both large and small group instruction. The major instructional objective areas on both the PRT and the PMT are displayed in Table 4.1, categorized by test levels appropriate to each grade.

Educational Staff

The teacher's questionnaire was designed by NTS, in concert with the Title I and Research and Evaluation staffs, to be an individually administered instrument. The teacher's survey was designed to assess teacher attitudes concerning classroom strategies, professional values, classroom environment, staff development, and inservice courses. The total battery consists of the following subsections:

- The *Inservice Course Survey* is designed to elicit a teacher's view concerning the Title I inservice courses which have been offered so far during this academic year.
- The *Staff Development Survey* elicits teachers' comments concerning the different inservice activities (workshops, professional meetings, staff development days, and consultant visitations) in which teachers participated during the academic year.
- The *Educator's Professional Values Scale* is a survey used to assess the teachers' beliefs regarding the teaching/ learning process. This instrument contains the following empirically defined factors: attitude toward student-centered education, subject matter emphasis, teacher-directed versus student-directed orientation, and subject matter integration.
- The *Classroom Management Inventory* is a direct, self-report instrument designed to measure the way teachers will respond in a series of hypothetical classroom situations. The instrument presents situations, each with four alternate actions; the teacher then selects the alternative which is most characteristic of the way he or she will respond.

- The *Classroom Environmental Survey* provides information concerning the environment within the individual Title I classrooms.
- The *Resource Teacher Survey* is designed to uncover the various strategies and methodologies used by the resource teachers to serve the students who were referred to them by the classroom teacher.

Administrator/Parent Participation Instruments

- The *Administrator Questionnaire* is designed to collect basic background data concerning the number of years of experience and the educational background of school administrators. The administrators are also requested to comment on their feelings concerning the strong and weak points of the Title I program in their schools.
- The *Parent Questionnaire* gathers information concerning parents and their children who are involved in the program. The parents respond to a series of questions which solicit their attitudes concerning their own involvement in the Title I program.

It has often been noted that otherwise sound program evaluation findings lack "generalizability", because careful attention was not given to sampling considerations when the evaluation was initially planned. In the present evaluation, most instruments were administered on a total enumeration basis. Instruments were administered to *all* eligible students except as noted for individual instruments. This fact increases the confidence with which the results of this evaluation may be generalized. Table 4.1 summarizes the sample sizes and sampling approach for each instrument employed in the evaluation.

Table 4.1: SAMPLING PLAN
TITLE I AND NON-TITLE I STUDENTS BY GRADE, BY INSTRUMENT*

INSTRUMENT	TITLE I					NON-TITLE I				
Student Related	K	1	2	3	7	K	1	2	3	7
SIF	274	2003	1654	1627		192	991	872	725	
SOS		1920	1625	1655			908	779	706	
CAP		168	189	178			153	179	164	
CTBS	1542	1721	1634	1637						
PRT										
PMT										
Parent Questionnaire	270									
Staff Related	780									

*—N's Represent Matched Data Sets

FOOTNOTES

[4.1] A. Jackson Stenner, *An Overview of Information Based Evaluation: A Design Procedure*, Information Based Evaluation Series Book 1 (Arlington, Virginia: IBEX, Inc. 1972), p. 1.

CHAPTER V
TEACHER PROFILE OF THE TITLE I CHILD

Since 1974, NTS Research Corporation (NTS) has evaluated the Title I program in the District of Columbia public schools. Each year the reading and mathematics achievement of the Title I students, as well as a selection of additional student variables and administrative and parent-related variables, has been investigated. Part of the annual evaluation has been an attempt to characterize "the average Title I student" in terms of certain informational or contextual parameters. This chapter of the 1976-77 final evaluation report continues this indepth look at the typical Title I student, based on the data supplied by Title I classroom teachers on the Student Information Form (SIF).

The SIF was distributed throughout the Title I schools in the District of Columbia. Teachers in kindergarten and grades one through three were asked to complete the SIF for each student in their respective classrooms. The eventual sampling resulted in a total of approximately 8200 Title I and 3000 non-Title I students in grades K-3 being described by their teachers on the SIF.[5.1] The data collected on each student in this sample were submitted to cross tabulations and stepwise regression analyses (using postreading and mathematics scores as criterion variables) from the *Statistical Package for the Social Sciences* (SPSS) programs. All results cited in this chapter are based upon the output from these SPSS analyses.

The SIF itself underwent some modification since the 1975-76 evaluation. Design conferences were held with the staffs of NTS, the Title I project, and the Division of Research and Evaluation in attendance. The purpose of these conferences was to alter the information requests embodied in the SIF to approximate more closely the needs of the Title I staff in program planning. Although a few rather major changes in item definition were made, the larger proportion of the SIF items remained sufficiently similar to enable some comparisons to be drawn with data from both of the previous evaluations (1974-75, 1975-76).

Preschool Experience

The question of attendance at some form of preschool is an example of an SIF item which remained intact across all three years of the evaluations. In the 1974-75 school year, the final evaluation report stated that Title I first graders were less likely than non-Title I first graders to have had any form of preschool experience (half of the Title I students vs two-thirds of the non-Title I students). Last year's evaluation report cited that although Title I students were still less likely to have gone to a "preschool," the difference in proportions of Title I vs non-Title I was not as extreme as during the 1974-75 school year (somewhat less than half of the Title I students as opposed to somewhat more than half of the non-Title I students). This year's results indicate that the trend is continuing, the trend being that fewer students in both groupings have had preschool experiences. The proportions of first graders in particular described by their teachers as having attended some type of "preschool" were 42% of all Title I and 47% of all non-Title I students in first grade. Hence, although less of the Title I sample than of the non-Title I sample from first grade had attended "preschool," both groups' proportions are less than 50 percent and are not extremely disparate. In fact, over all grades K-3, approximately 41% of the Title I and 44% of the non-Title I students were known to have had preschool experience. A rather large proportion of both Populations (28%) was not known either to have had or to have missed having preschool experiences.

It seems that the recommendation made in last year's final evaluation report is even more applicable this year, in view of the declining percentage of Title I students with preschool experience. That recommendation is that a systematic follow-up of developmental and achievement profiles of preschool graduates be conducted to determine the amount of need for expansion in the preschool component of the District of Columbia public schools.

Mobility

In last year's evaluation, it was discovered that over 90 percent of the Title I students in the SIF sample had been enrolled in their respective classrooms since September of that school year. Fewer non-Title I students (between 82% and 86% across the grade levels) in the SIF sample were enrolled in

their respective classrooms since the beginning of the school year. These data have been virtually replicated during the 1976-77 evaluation. Ninety percent of the Title I students in this year's SIF sample, compared to between 80% and 86% of the non-Title I sample (84% across grades K-3), were enrolled in the same classrooms in which they began in September. The mobility rates for Title I and non-Title I students are seen as being somewhat disparate in view of these results. The cause for the disparity, unfortunately, remains as elusive as it was last year.

Family Support

This item was modified slightly since the 1974-75 and 1975-76 evaluations. During these two evaluations, the index of the family's being supportive of the student's efforts in school was reported. Title I students, during 1975-76, were twice as likely to be characterized as receiving the lowest amount of family support, while non-Title I students were twice as likely to be described as receiving the highest amount of family support. In addition, family support was stronger and more commonly reported at the kindergarten level and then declined with each successive grade.

The SIF item measuring family support in this year's evaluation notes its presence or absence (in the teacher's opinion) and the type of support, as described by these eight categories: parent-teacher conferences; telephone contacts; attendance at school activities; membership in the PTA or other formal school organization; written contacts; encouragement of the child in his/her achievement; provision of enrichment experiences; and "other" types of support. Title I students were characterized by their parents as receiving somewhat less family support than their non-Title I cohorts, the different proportions supported being approximately 76 percent and 84 percent, respectively, across the four grade levels with little intergrade variance. This difference with respect to Title I status was statistically significant ($x^2 = 63.38$, $df = 1$, $x < 0.001$).

The qualitative patterns of family support, however, appeared to be quite similar. Both Title I and non-Title I groups seem to draw their primary support from parent-teacher conferences. Written contacts and direct encouragement of the child in his/her achievement provide the large part of the remainder of the family support. The primary difference for the two groups is found in the provision of enrichment experiences. Non-Title I parents are nearly twice as likely to provide such opportunities to their children as are Title I parents (respective proportions are 14.3 percent vs 8.7 percent. Perhaps the Title I project staff should consider strengthening encouragement to become involved in Title I field trips and other enrichment activities on the part of Title I families.

Problems Inducing Pupil Personnel Referral

Several items from previous evaluations were "grouped" in an attempt to define their intent more clearly. The resultant cluster of items was rephrased in the current evaluation to read: "Does the student have any of the following problem areas which would require him/her to be referred to the Pupil Personnel Service Department?" The categories are withdrawn and aggressive behaviors, economic need, and excessive absenteeism. Each catgory is treated separately.

In general in the two previous evaluations, Title I students were noted as being three to four times more likely to require pupil personnel services (PPS) referral than non-Title I students. The proportion doubled in the transition from kindergarten to first grade and held relatively steady there through grade three. The present evaluation, however, shows a decided decline across grades K-3 in the proportions of Title I students requiring PPS referral, coupled with a simultaneous, slight increase in the proportions of non-Title I students requiring PPS referral.[5.2]

In kindergarten, the proportion of Title I students who were referred to PPS (43%) was nearly three times as large as the proportion of non-Title I students referred to PPS (16%). In first grade, however, the Title I proportion dropped to twice as large as that of the non-Title I students (37% vs 19%), respectively. In grades two and three, the Title I and non-Title I proportions for PPS referrals held steady at a ratio of approximately 3 to 2, (33% vs 22% at grade two; 33% vs 20% at grade three). These data show a marked decrease in the need for PPS referral in the Title I group from kindergarten through grade three, when all four categories of reason for referral are examined together.

For those students whose teachers characterized them as exhibiting withdrawn tendencies which would require them to be referred to PPS, 33% of the Title I students vs 20% of the non-Title I students in kindergarten, the ratio of these proportions being nearly two to one, fell in this category. The Title I student proportion then began to decline through grade three, while that of the non-Title I students remained fairly steady. The final ratio by grade three of the relative proportions of Title I vs non-Title I students described as exhibiting withdrawn tendencies to this degree is nearly one to one (25% vs 22%, respectively). This means that by the end of third grade, the percentage of students from the Title I sample who exhibit this severe withdrawn tendency is only slightly higher than the percentage of the non-Title sample described by their teachers.

Students characterized as exhibiting economic need severe enough to merit PPS referral show similar results to those described as "withdrawn." The Title I sample proportion in kindergarten (32%) was over four times as large as that of the non-Title I sample (7%). By first grade, however, the Title I sample proportion (25%) dropped to slightly greater than the non-Title I proportion (21%). The sample proportions for both Title I and non-Title I categories levelled off (20-22%, each) and resulted in a ratio of approximately one to one by the end of third grade. Thus, although Title I students in kindergarten seem to be more likely to be labelled as "economically needy" by their teachers than their non-Title I cohorts, the respective proportions level off at second grade and hold steady, with the Title I proportion slightly higher than the non-Title I proportion.

The "aggressive" category holds more surprises than the other categories. The Title I sample proportions generally increase from 23% to 40% across grades K-3, while the non-Title I sample proportions across the same grade level start out at 53% and waver from 33% to 47%. The overall ratio (across grades K-3) between the Title I and non-Title I proportions is approximately one to one, with the non-Title I student percentages consistently somewhat higher than those for Title I students (see Table 5.1). Throughout grades K-3, in fact, the non-Title I proportion remains higher than that for Title I. The proportions for both categories, however, show a steady increase throughout these early elementary school years. Apparently, the students in this year's SIF sample, regardless of Title I status, tend to become more "aggressive" (to the point of requiring PPS referral) with each successive grade level, at least up to grade three.

Table 5.1

Percentage of Title I and Non-Title I Samples Described as Exhibiting Aggressive Tendencies Severe Enough to Merit Pupil Personnel Service Referral

Grades	Title I Proportion	Non-Title I Proportion	Ratio of Title I to Non-Title I
K	23%	53%	1 : 2.3
1	28%	33%	1 : 1.2
2	40%	47%	1 : 1.2
3	37%	41%	1 : 1.1

Finally, the relative proportions of Title I vs non-Title I students who are described by their teacher as being absent from school to the point of meriting PPS referral show a reversal between grades one and two: in grades K and one, a larger proportion of non-Title I students than of Title I students is excessively absent (22% vs 16%), while in grades two and three the ratio of Title I to non-Title I sample proportions slightly favors the Title I group (17% vs 14%, respectively). Across all four grades, however, the ratio of Title I to non-Title I sample proportions in the "excessively absent" category is approximately equal.

In relation to previous years' evaluations, there were actually no comparably stated SIF items which could be used in a longitudinal sense. Two former items referred to the degree of aggressiveness and withdrawn tendency which would interfere with classroom performance. This, however, is not quite the same information as that collected in this year's SIF item discussed above. A teacher might view a student as being aggressive or withdrawn to the point of the observed classroom performance being impaired, but PPS referral might not be considered as a solution. On the other hand, individual teachers might view different degrees of intensity of aggressiveness or withdrawn tendency as requiring PPS referral, thus making it all but impossible to determine where to draw the line along the

continuum of either trait, indicating the necessity for PPS referral. A related difficulty with the characterization of "aggressive" in particular is discussed in the following section. The data for this SIF item, therefore, are best considered solely within the frame of reference of the current evaluation and not from a longitudinal viewpoint.

Positive Strengths

One of the completely new SIF items this year asked teachers to rate their students individually on the basis of their positive strength in five areas: perseverance, motivation, acceptance of responsibility, aggressiveness, and peer interaction. One logistical difficulty must be mentioned here, namely, the use of the characterization of "aggressiveness" as a positive strength, especially in view of its usage on the same data collection form (SIF for 1976-77) as an item connecting "aggressiveness" as a problem area leading to PPS referral. This apparent contradiction in terminology itself, with both items being listed within three inches of each other on the questionnaire, is sufficient to regard the results obtained for the "aggressive" sections of both items as containing some measurement error. In effect, the trait is implied to be a strength in SIF item 2; in item 5 it is classified as a problem area requiring PPS referral. It is not hard to envision that some respondents would become inexorably confused by this apparent paradox. In addition, in the last two evaluations (1974-76), the term "aggressive" was used in a detrimental sense again — "interfering with classroom performance." Any teachers contained in the current year's SIF sample who completed SIFs in previous years may have recalled this usage of the term "aggressive" and been even further imbued with conflict. Finally, it is not clear that the majority of people in general, and Title I school teachers in particular, view aggressiveness as a positive strength. Perhaps the traits assertiveness, independence, outspokenness, or self-confidence would strike more of an image of a positive strength. It seems that a poor semantic choice was made in including the term "aggressive" in the list of positive strengths. It is recommended that the wording be reconsidered for the 1977-78 evaluation and perhaps a less paradoxical and contradictory term (in terms of other SIF items) be chosen for this trait category.

In general — for all five categories and all four grade levels — Title I students were proportionately less likely to be described as having a "high degree" (on a five-point scale) of any of the positive strengths included on this item. In every category except aggressiveness, non-Title I students at each grade level were between two and three times more likely than their Title I cohorts to be labelled as having the highest degree of the trait listed.[5.3] If the two highest degrees of each trait are collapsed, the non-Title I vs Title I ratios for all categories except aggressiveness range from 2:1 to 5:3 at all grade levels. In addition, there appears to be very little trend resulting from increasing age (or grade) level in either direction, the ratios holding relatively steady in every category except aggressiveness. Collapsing across grade levels and excluding aggressiveness, then, the proportion of non-Title I students described as having a "high" degree (collapsing the two highest degrees) of the positive strength involved is twice as large as the Title I student proportion so described[5.4]; if only the highest degree of the trait involved is considered, then the non-Title I proportions range between two and three times larger than the respective proportions for Title I students.

Keeping in mind the built-in confusion with the "aggressive" category, a trend of slightly decreasing proportional disparity between Title I and non-Title I groups from kindergarten through grade three can be noted. If only the highest degree of the trait is considered, the ratios of non-Title I to Title I proportions are approximately 2:1 in kindergarten and first grade (5:2 and 8:5, respectively) and drop to approximately 4:3 in grades two and three. If the two highest degrees of the trait are collapsed, the ratio drops very gradually from 5:3 to 4:3 from Kindergarten through grade three, non-Title I vs Title I proportions respectively. This consistent trend of the non-Title I proportion being greater than the Title I proportion of "aggressive students", and the ratio of those proportions gradually lessening throughout the four grade levels, tends to replicate the results observed in the item involving PPS referral due to aggressive behavior (see Table 5.1). This is not surprising, since both items may be viewed as asking the same thing — "Is this student aggressive?" — but it does not aid in interpreting any differences between the two types of observed "aggressive" behaviors, nor in delineating clearly Title I vs non-Title I group differences.

The fact that non-Title I students seem to be more likely viewed as possessing a greater number of positive strengths in even such a small sample of traits merits further consideration. One interpretation could be that there exists some teacher judgment bias against Title I students in the classroom. Another explanation might be best described as contextual in effect: since many of the classrooms in the SIF sample contain both Title I and non-Title I students, the effect of having a large proportion of the classroom designated as "Title I" automatically facilitates and perpetuates a perceptual set for contrasts. Thus, differences may be more easily seen between the two groups of students within the classroom, sometimes even when the differences are slight or even nonexistent. In addition, a classroom teacher supposedly responds to SIF items utilizing, whether or not consciously, all the myriad instances and events which happened throughout the school year. Many of these instances must be retained in terms of group differences, for example, field trip participation, special equipment usage, and particularly Title I laboratory and tutoring group attendance, leaving the comparatively small non-Title I group participating in some regular classroom activity. Hence, it would appear difficult for a teacher not to recall each student in the light of Title I vs non-Title I status and, therefore, "differences." Whether these differences are viewed favorably for one group over the other depends on a constellation of factors, all of which are not typically dependent upon the immediate classroom setting.

In summary, if a teacher-judgment bias does exist in perceiving Title I students, care should be taken to investigate the nature of that bias and its effects. Especially the results from teacher-student interactions should be considered in developing the strategies for the examination. Not enough data of conclusive quality have been collected to attest to the existence of such a bias in the District of Columbia school system. However, the possibility that such a bias is in operation certainly suggests a need for further well-formulated examination.

Need for Title I Services

This question was treated at length in the 1975-76 final evaluation report. The two methods of student selection for the Title I program were compared: teacher estimate of need for service, and need for service as indicted by achievement test scores. Relatively large percentages of "false positives" and "false negatives" — students whose teachers judged them as not needing Title I services but whose test scores indicated a definite need, and students result from the usage of test scores alone as a selection criterion variable in our analysis.

This question was treated at length in the 1975-76 final evaluation report. The two methods of student selection for the Title I program were compared: teacher estimate of need for service, and need for service as indicated by achievement test scores. Relatively large percentages of "false positives" and "false negatives" (student misclassifications) were found. This year, between 41% and 47% of the Title I students in grades K-3 were described by their teachers as exhibiting a high need for Title I services, in contrast to the same characterization for only 4% to 16% of the non-Title I students. Conversely, between 6% and 9% of the Title I students were described as not requiring Title I services by their teachers, compared to a range of 40% to 62% of the non-Title I group described identically. Table 5.2 displays the "misclassifications" for both the 1975-76 and 1976-77 school years. The percentages of false positives may be viewed in the second row, first column cells; false negatives, in the first row, second column cells. It seems that the proportion of misclassifications has decreased since last year's evaluation, by a factor of approximately 25%.

Table 5.2

Percentage of Students Identified as Needing Title I Services
Using Two Different Methods: 1975-1977

		Norm-Referenced Test Identified Student As Needing Special Services			
		(1975-76)		(1976-77)	
Teacher rated student as having highest priority for services		Yes	No	Yes	No
	Yes	44%	16%	44%	12%
	No	11%	37%	8%	42%

This is encouraging, since misclassifications (as noted in last year's final evaluation report) cost a great deal in dollars and in human benefits.

Obstacles to Educational Progress

A new item was introduced this year, asking the teacher to indicate which, if any, of four problem areas — physical disruptiveness, verbal disruptiveness, peer affinity, and resentment of authority — served as in impediment to the student's educational progress. The proportions of Title I and non-Title I students overall having such problems are 37% and 26%, respectively. A resentment for authority is prevalent only in kindergarten for the Title I group. Non-Title I kindergarteners are more likely to be verbally disruptive. In grades one and two, Title I students tend to be physically disruptive, while their non-Title I cohorts are more likely to get into difficulty through peer affinity and verbal disruptiveness. This trend for both groups continues somewhat into third grade, with Title I students mainly troubled with physical and verbal disruptiveness and non-Title I students, with peer affinity. In general, verbal disruptiveness, peer affinity, and physical disruptiveness are the primary problem areas, each being slightly less prevalent than the one preceding it.

Communication Patterns Interfering With Classroom Performance

Another item identical in both the 1975-76 and 1976-77 evaluations asks the teacher to indicate which, if any, of five communiction patterns evidenced by the student interferes with classroom performance: bilingual, nonstandard English, dialect, aural, nonverbal. Last year approximately one-third of all of the students in the SIF sample were noted by their teachers as exhibiting at least one of the communication patterns described above; of those students with a detrimental communication pattern, 80% were receiving Title I services. This year's results show only 20% of the total SIF sample being described as exhibiting one of the detrimental communication patterns, but the Title I proportion of this group is 81%.[5.5] Thus, although it seems that fewer students were deterred by one of the five communication patterns, the bulk of this group is still composed of Title I students. (This is at least partially due to the nearly three to one composition of the SIF sample favoring Title I participation.) In general, nearly 22% of all Title I students and 14% of all non-Title I students in the SIF sample are described as evidencing one of the five detrimental communication patterns.

Another similarity between the 1975-76 and the current evaluation is the prevalence of nonstandard English difficulty. Although only 20% of the kindergarten students were described as having this problem, between 69% and 75% with the language difficulty (increasing with grade level) of all students in grades 1-3 were so characterized. The actual ratio of Title I vs non-Title I students exhibiting nonstandard English difficulty approximates one to one, with slight fluctuation in grades K-3 in terms of favoring either Title I or non-Title I students. Thus, it seems that nonstandard English problems remain the most prominently noted detrimental communication pattern for all students in the SIF sample. It will be helpful to recall this result when reading the chapter which discusses the results of the language facility assessment this year.

Nonverbal difficulties accounted for another 14% of the students with a detrimental communication pattern. Non-Title I students seem to have more trouble with this pattern in kindergarten, but then the Title I student proportion exceeds that of the non-Title I students in a ratio of approximately 3:2 in grade one, 4:3 in grade 2, and 6:1 in grade 3.[5.6] Thus, it appears that nonverbal problems are increasingly more common for Title 1 students than for non-Title I students, but the prevalence of such difficulties in general is not frequent.

Finally, aural problems seem to be more prevalent among the Title I group in general, at a ratio of nearly three to one in favor of the Title I students being more likely to have aural difficulties than their non-Title I cohorts. In grade three, the trend reverses somewhat, with the proportion of non-Title I students in ratio to the Title I proportion equal to approximately four to three. The reversal noted in grade three appears to be inexplicable at present.

Facilitative Background

Last year's evaluation determined that only one in 15 Title I students enjoyed a culturally rich experiential background, while one of four of the non-Title I group enjoyed such a background. This

year's results are promising. Approximately one in nine (11.4%) of the Title I students is characterized as being aided by experential background. The non-Title I student proportion also shows a slight increase from last year: nearly one in three students (31.5%) having a facilitative experiential background.

Physical or Health Problems

The previous year's evaluation noted 10% of the K-3 population in Title I eligible schools as having physical or health problems, with the ratio of the Title I to be the non-Title I students equal to 2:1. In the present evaluation, the Title I proportion of students thus characterized decreases gradually from 24% to 15% across grades K-3, while that of non-Title I students with such problems gradually increases from 1% to 8% for the same grade span. Even so, slightly more than twice as large a percentage of the Title I students as of the non-Title I students in general have physical or health problems. Title I students are more likely to have speech (two to one odds) and emotional (seven to three odds) problems than non-Title I students. Title I students are also slightly more likely to have dental (four to three odds) problems than non-Title I students. The proportions of Title I and non-Title I students with either hearing or dental problems are approximately equal. Non-Title I students are slightly more likely to have been treated for their problems than their Title I cohorts (odds of approximately six to five).

Family Support, Experiential Background, and Positive Strengths

It seems that a high degree of family support in the student's efforts is associated with a high degree of positive strength in perseverance, acceptance of responsibility, and motivation. The same can be said of a high degree of facilitative experiential background with respect to these positive strengths. From the types of analyses performed to date, the exact nature of the interrelationships among these sets of variables is not clear. Perhaps small, pilot studies could be planned for future evaluations which would involve the manipulation of one or more of these variables, for example, active facilitation to family support, or active facilitation to one or more positive strengths. The information gleaned could be of great service in developing new parental activities and, possibly, in enhancing the positive strengths of the Title I students.

Summary

The examination of the SIF data for the 1976-77 school year reveals some similarities with previous year's evaluation results, as well as some dissimilarities. Title I students are less mobile (as a group) than their non-Title I peers. Family support of efforts in scholastic endeavors follows mainly the same patterns for both Title I status groups, although it is somewhat more prevalent among the non-Title I group; Title I support holds steady, however, while non-Title I support declines.

Non-Title I students are definitely more likely to be characterized by positive strength in the five areas listed on the SIF than are Title I students. The non-Title I group is also less likely in general to be referred for PPS attention than the Title I group. The one exception is in the category of aggressiveness, where non-Title I student proportions tend to outbalance Title I student proportions. Title I students are classified twice as often as non-Title I students as having "special needs," and are also two times more likely to have speech or emotional problems.

Nonstandard English remains the leading contributor to educational difficulty resulting from a communication pattern for both Title I status groups; however, of those students described as having this problem, 81% of them are Title I students (due in part to the great disparity in the Title I vs non-Title I population proportions in the SIF sample). Title I students also seem to have more trouble with aural and nonverbal communication patterns, and the non-Title I students exhibit more tendency to bilingual difficulties.

Facilitative experiential backgrounds seem to be much more typical in the non-Title I group than in the Title I group. However, several inservice-type projects involving both teachers and family with the Title I students might begin to remedy this situation, as well as equalize the family support ratios and enhance positive strengths in certain areas.

Several recommendations with respect to instrumentation have been made. One is to decide upon the intent of the term "aggressive" and to make the necessary modifications in the appropriate SIF item(s) which will alleviate the contradiction and counnterintuitive implications currently induced. Another suggestion is to clarify the meaning of "peer affinity" as it is used to indicate a clear problem area. The two items referring to "special needs" and "physical or health problems" seem to overlap and might be efficiently collapsed into one less redundant item. In addition, the "problem areas" interfering with educational progress seem to be closely related in a conceptual fashion to the PPS referral categories, the only apparent inconsistency arising from the resulting PPS referral for the latter group. Even so, the former group of "problem areas" seems just as likely to be cause for such referral. Further consideration might lead to collapsing these two items and rewording their intent.

FOOTNOTES

[5.1]The SIFs returned for grades four and seven constituted such small proportions of the total Title I fourth and seventh grade populations that the results presented in this chapter are based solely on data drawn from kindergarten through grade three.

[5.2]The difference between the 1974-76 data and the current data may be merely a reflection of the different interpretation made by the teachers in the 1974-76 school years in response to the question, "Does the student have serious behavioral problems requiring referral to the Pupil Personnel Service Department?" Although it might be argued that aggressive and withdrawn behaviors could be classified as "serious behavioral problems," it is not certain that all teachers would see these two traits as such, nor that these two traits constitute the entire population of such problems. It might be that some teachers do not regularly make referrals to PPS due to absenteeism or perceived economic need. Therefore, the comparison between this year's and the previous year's overall response to need for PPS referral should be interpreted with caution and not used as a firm basis for Title I vs non-Title I contrasts.

[5.3]For peer interaction in grades two and three, the non-Title I vs Title I ratio was closer to 5:3.

[5.4]The ratio thus calculated for peer interaction is, once more, closer to 5:3.

[5.5]In both evaluations (1975-77), some students may have been included in more than one communication pattern category. Thus, these data must be considered as duplicated count data, since there is no information indicating the percentage of students counted in only one category.

[5.6]The actual figures for grade three are 52 of 543 Title I students (9.6%) vs 2 of 123 non-Title I students (1.6%). The number of non-Title I students in this category for grade 3 is small, but the total number of non-Title I students in grade three with communication pattern problems is close to that in grades one (157) and two (118).

CHAPTER VI
STUDENT ACHIEVEMENT IN READING AND MATHEMATICS

The primary objective of the Washington, D. C., Title I program is to improve student achievement in reading and mathematics. This chapter explores in detail the reading and mathematics achievement of students in the Title I schools. As in most Title I programs, improvements in educational achievement are assessed through analysis of changes in achievement test scores.

Title I program evaluation is conducted to determine whether or not the program results in general improvements of student academic performance. Two types of information are required for this analysis. The first is an assessment of how well the students who participated in the Title I program performed on an outcome measure, such as a posttest reading or mathematics achievement score. The second is an assessment of how well these same students would have performed if they had not participated in the Title I program.

It is straightforward procedure to determine how well the Title I program participants performed on the outcome measure. The observed posttest performance of the students who participated in the Title I program is their observed mean posttest achievement score. For this evaluation, the CTBS/S or CTBS/T is used to measure student achievement. It is considerably more difficult to estimate how these same students would have done if they had not participated in the Title I program. One of the standard procedures used to determine the no treatment expectation is the "norm-referenced model."[6.1] One version of the norm-referenced model uses a nationally normed test like the CTBS/S or CTBS/T to provide for each student a percentile score or standard of relative rank that is based upon the student's test performance in relation to a national norm group.

The basic assumption of the norm-referenced model is that students as a group will tend to maintain their relative rank or percentile standing over the course of a school year. This is unless there are some unusual circumstances that generally affect the students' academic development. If the average relative performance of the students in the spring testing is the same as their average relative performance in the fall testing, then the percentile of the average posttest achievement score, as derived from the norm tables, would be the same as the percentile of the average pretest achievement score. In this case, the students as a group would be considered to have performed as expected. If the average relative performance of the students in the spring testing is better than their average relative performance in the fall testing, then the percentile of the average posttest achievement score would be at a higher level than the percentile of the average pretest achievement score. In this case, the students as a group would be considered to have performed better than expected.

For students who are participants in a Title I program, the norm-referenced model presumes that a better than expected performance is attributable to the effects of the Title I program. Within this framework, the treatment effect attributed to the Title I program is the observed posttest performance minus the expected no-treatment posttest performance. Consequently:

Treatment Effect	=	Observed Posttest Treatment Performance	−	Expected Posttest No-Treatment Performance

The norm-referenced model is presented in terms of achievement scores that have been transformed from percentiles into NCE[6.2] scores. The expected posttest no-treatment performance of the Title I students is the percentile corresponding to their average pretest achievement NCE score. Since the data are presented terms of NCE scores, the norm-referenced model presumes that the effect of the Title I program is indicated by the differences between the average pretest and average posttest achievement NCE scores of the Title I program participants.

In order for the norm-referenced model to be used to determine an unbiased estimate of program impact, the following assumptions of the model must be satisfied:

(1) The pretest should not be used to select program participants;

(2) The tests must be administered to the students at the time(s) of the year when the test was normed;

(3) The same test form and level should be used for both pretest and posttest;

(4) Only those students who have both pretest and posttest scores can be used in the analyses;

(5) At least 2/3 of the students from the program must be included in the analyses;

(6) At least 2/3 of the program must occur between the pretest and the posttest.

The data sets that are available for the 1976-77 D.C. Title I program do not meet all of these assumptions at each of the grades served by the Title I program. Table 6.1 displays in tabular form the assumptions that were met by grade level.

Table 6.1 Grade Level by Assumptions Met in The Norm Referenced Model

GRADE	ASSUMPTION					
	1	2	3	4	5	6
K	Yes	Yes	Yes	Yes	No	Yes
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	No	Yes	Yes	Yes	Yes
3	Yes	No	Yes	Yes	Yes	Yes
7	Yes	No	Yes	Yes	Yes	Yes

The kindergarten's not meeting assumption 5 results from lack of ID numbers to match the data pre and post and accounts for the small sample.

The information used to identify students who participated in the Title I program was contained in the Student Information Form (SIF). The students whose achievement scores are included in these analyses at grades K through 3 are those students who have matched pre/post achievement data. A separate list of Title I students in grade 7 was provided so that their data could be included in the analyses.

An achievement gain is considered to be educationally significant by one accepted standard.[6.3] This standard states that if the mean achievement gains are at least as large as one-third or one-quarter of a standard deviation of the score distribution from the norming group of the test that is being used to measure achievement, then the gain is significant in terms of NCE's. A gain of between 5.25 and 7.0 NCE's can be considered to be educationally significant. With this standard as a guide, D. C. Title I students evidenced educationally significant gains in mathematics during the school year at grades 1, 2, 3, and 7. They also demonstrated educationally significant gains in prereading at grade K and 2 and reading at grade 2. The mathematics gain of Title I students in grades 2 and 3, and the prereading and reading gains of Title I students at grades K and 2, are each approximately 10 NCE points, or about one-half of a standard deviation of the score distribution from the norming group of the CTBS achievement test.

The data on the mean pre and post achievement test scores and the treatment effect model are presented in Table 6.2 and in Figures 6.1-6.5 for both reading and mathematics, in grades 1-2 and 7 and prereading in kindergarten. The treatment effect attributed to the Title I program is determined

as the average pretest achievement test scores of Title I students subtracted from the average posttest achievement test scores of these same students. The current version of the norm-referenced model states that the only relevant consideration is whether the treatment effect is positive. According to the norm-referenced model, the D. C. Title I program is indicated as having a positive impact at grades K-3 and 7. The average gains in reading and mathematics for Title I students at grades 1-3 and 7 are all statistically significant at the .01 level or better.

ACHIEVEMENT PROFILES

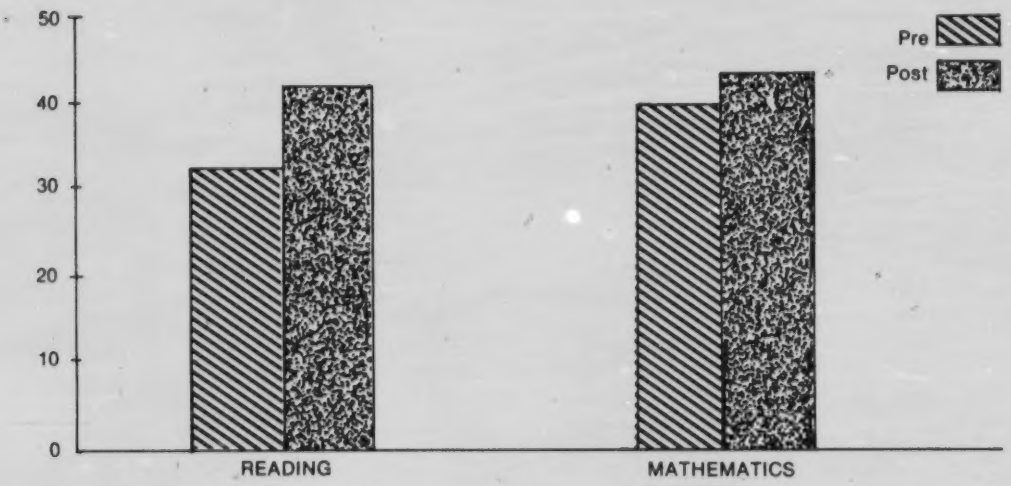
An overview of the mean posttest achievement levels for both the Title I and non-Title I students in grades K-3 can be obtained by inspecting the posttest achievement profiles presented in Figures 6.6 through 6.9. The first feature of these figures is that both groups have parallel mean profiles. There do not seem to be different rates of development and learning for the two groups associated with differences in content area.

The second noticeable feature of these figures is that the Title I profile is lower than the non-Title I profile. The individual differences in posttest achievement levels are all statistically significant. Some differences in profile levels for the two groups would be anticipated because the Title I group was selected partly on the basis of a relative academic need when compared to the non-Title I group. The third feature of these figures is that for both groups, and for all grade levels, the mean mathematics total score is higher than the mean reading total score. A fourth feature of these figures is that the non-Title I groups for all grades (K-3) have mean posttest achievement levels that are close to or higher than the national average. This characteristic of the non-Title I group indicates the existence of a pool of capable students within the Title I schools.

TABLE 6.2 AVERAGE PRETEST AND POSTTEST ACHIEVEMENT SCORES FOR TITLE I STUDENTS, AND THE NORM-REFERENCED MODEL ESTIMATES OF TREATMENT EFFECT IN NCE'S

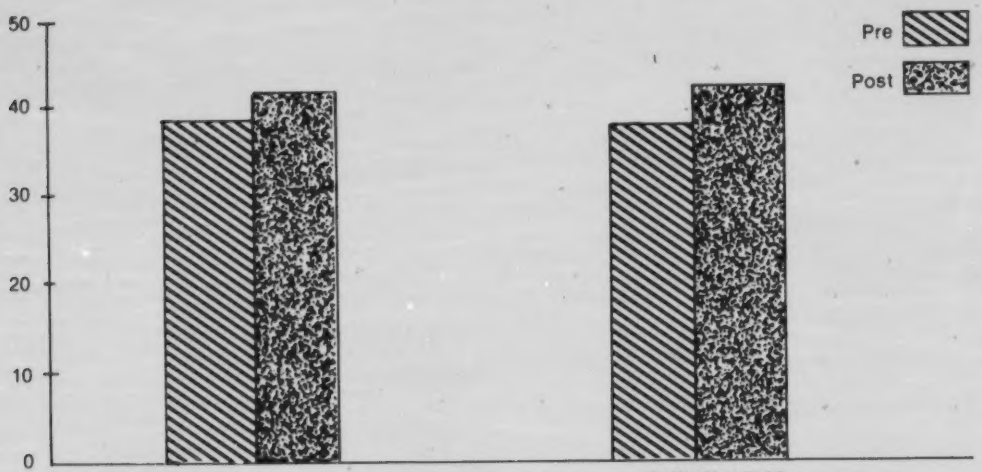
		Average Pretest	Average Posttest	Estimated Treatment Effect	N
Reading	Grade K	31.22	40.96	9.74	156
	Grade 1	37.99	41.28	3.29	1647
	Grade 2	23.16	33.88	10.71	1578
	Grade 3	27.51	31.55	4.04	1619
	Grade 7	23.01	24.95	1.94	940
Mathematics	Grade K	39.29	42.54	3.26	249
	Grade 1	36.42	42.68	6.26	1579
	Grade 2	26.42	37.19	10.77	1626
	Grade 3	24.68	35.74	11.06	1565
	Grade 7	20.47	28.74	8.27	831

FIGURE 6.1 GRADE K PRE AND POST ACHIEVEMENT DIFFERENCES IN NCE'S



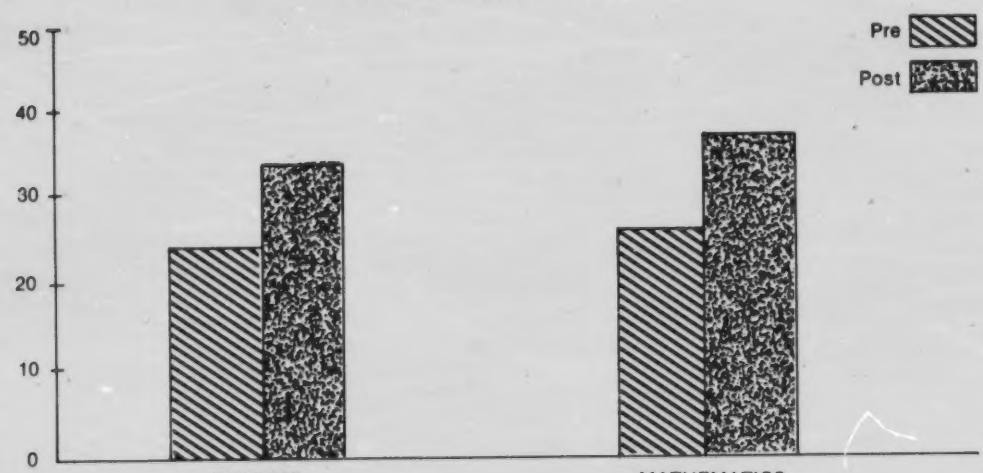
	PRE	POST	PRE	POST
$\bar{X}$	31.22	40.96	39.29	42.54
SD	15.97	16.66	18.34	19.84
Difference	9.74		3.26	
N		156		249
T		5.27		1.90
P		0.01		.10

FIGURE 6.2 GRADE 1 PRE AND POST ACHIEVEMENT DIFFERENCES IN NCE'S



	READING		MATHEMATICS	
	Pre	Post	Pre	Post
$\bar{X}$	37.99	41.28	36.42	42.68
SD	16.98	17.97	15.16	19.94
Difference	3.29		6.26	
N	1647		1579	
T	5.40		9.93	
P	0.01		0.001	

FIGURE 6.3 GRADE 2 PRE AND POST ACHIEVEMENT DIFFERENCES IN NCE'S



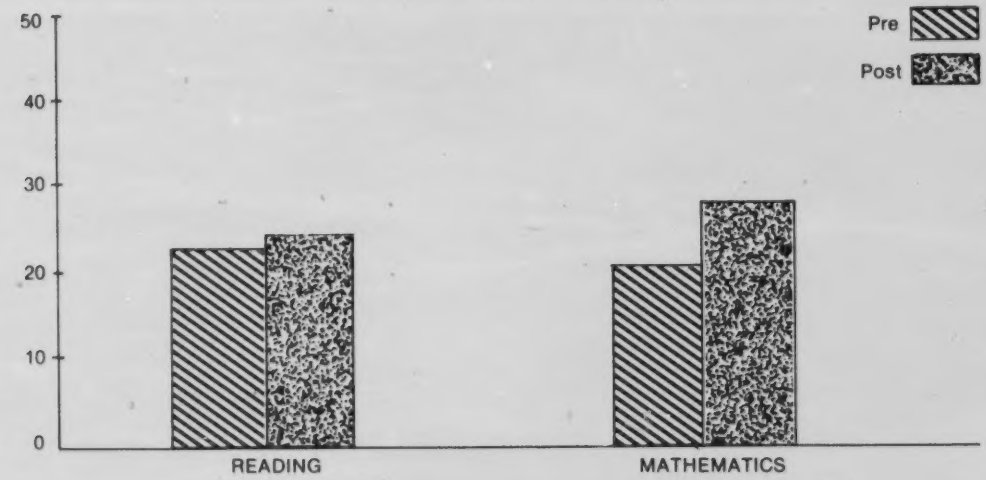
	READING		MATHEMATICS	
	PRE	POST	PRE	POST
$\bar{X}$	23.16	33.88	26.42	37.19
SD	12.50	16.28	13.51	17.02
difference	10.71		0.77	
N	1578		1626	
T	20.75		19.99	
P	0.001		0.001	

FIGURE 6.4 GRADE 3 PRE AND POST ACHIEVEMENT DIFFERENCES IN NCE'S

	READING		MATHEMATICS	
	PRE	POST	PRE	POST
$\bar{X}$	27.51	31.55	24.68	35.74
SD	12.68	13.85	12.42	14.88
Difference	404		11.06	
N		1619		1565
T		8.66		22.57
P		0.001		0.001

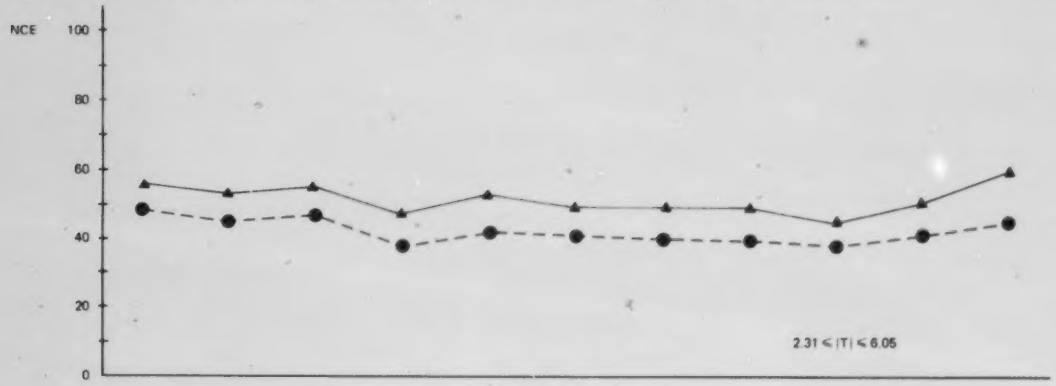
0.001

FIGURE 6.5 GRADE 7 PRE AND POST ACHIEVEMENT DIFFERENCES IN NCE'S



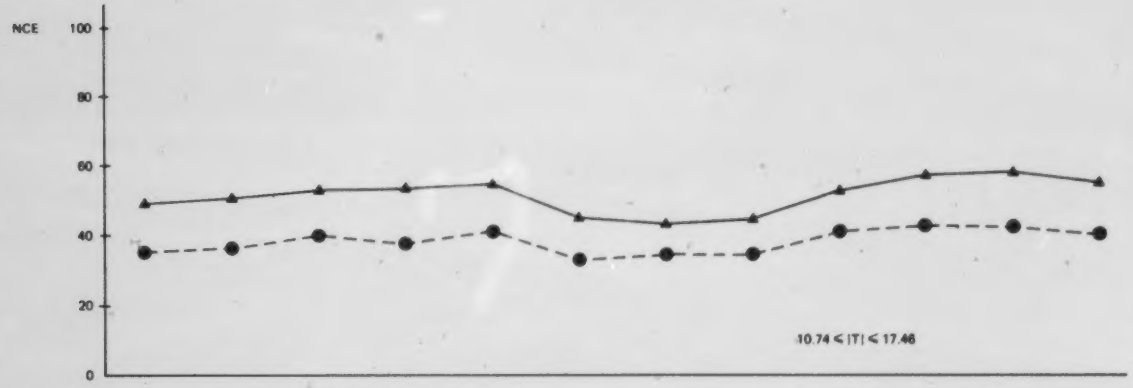
	READING		MATHEMATICS	
	PRE	POST	PRE	POST
$\bar{X}$	23.01	24.95	20.47	28.74
SD	13.70	13.95	14.01	17.35
Difference	1.94		8.27	
T		9.40		831
T		3.04		10.69
P		0.01		0.001

FIGURE 6.6. POST TEST ACHIEVEMENT PROFILES, KINDERGARTEN



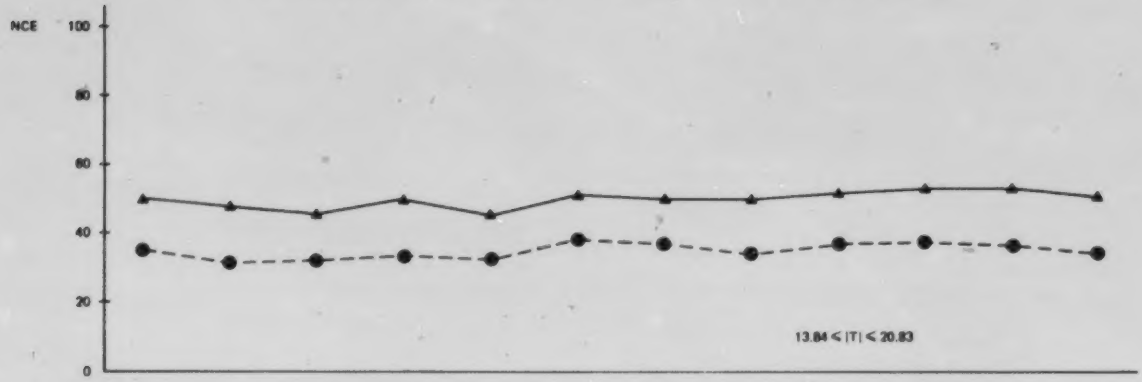
		Letter Forms	Letter Names	Alphabet Skills	Listening for Information	Letter Sounds	Visual Discrimination	Sound Matching	Visual & Aural Discrimination	Language	Pre-Reading Total	Mathematics
Non Title I —▲	$\bar{X}$	56.07	52.66	54.77	47.89	53.74	50.18	50.23	50.24	45.23	51.10	50.44
	SD	16.05	17.68	17.19	20.97	21.95	19.24	20.74	21.28	17.75	18.81	19.66
	N	67	62	62	64	62	60	61	59	57	50	63
Title I – –●	$\bar{X}$	48.20	45.91	46.94	38.28	42.72	41.46	40.02	39.80	37.80	40.96	42.54
	SD	18.48	21.19	19.88	20.90	19.97	18.77	21.81	19.70	16.13	16.66	19.84
	N	238	246	229	261	246	243	253	233	214	156	249

FIGURE 6.7 POST TEST ACHIEVEMENT PROFILES, GRADE 1



		Letter Sounds	Word Recognition I	Reading Comprehension	Word Recognition II	Reading Total	Language I	Language II	Language Total	Math Concepts & Applications	Math Computation	Math Total	Battery Total
Non Title I —▲	$\bar{X}$	48.65	50.46	51.89	52.09	54.49	44.44	42.89	43.62	52.90	57.06	57.26	55.18
	SD	17.45	18.29	17.55	19.26	16.58	19.21	17.88	17.26	19.60	19.11	18.78	16.87
	N	773	759	749	753	694	687	678	665	774	682	672	525
Title I – –●	$\bar{X}$	35.74	36.39	39.83	37.71	41.28	33.87	34.26	34.20	41.11	43.08	42.88	40.52
	SD	19.68	19.86	19.20	20.63	17.97	19.18	17.28	17.22	19.52	19.83	19.94	18.94
	N	1917	1891	1817	1845	1647	1615	1576	1542	1902	1636	1579	1151

FIGURE 6.8 POST TEST ACHIEVEMENT PROFILES, GRADE 2



		Vocabulary	Sentence Comprehension	Passage Comprehension	Reading Total	Language Expression	Spelling	Language Mechanics	Language Total	Math Computation	Math Concepts & Applications	Math Total	Battery Total
Non	$\bar{X}$	49.85	47.06	46.18	49.66	45.88	51.06	50.88	50.02	51.96	52.68	52.46	50.52
Title I	SD	16.63	18.59	17.81	16.62	16.87	16.34	20.60	18.31	19.57	18.72	18.23	17.83
——▲	N	686	659	648	627	581	579	585	543	645	654	633	490
	$\bar{X}$	34.41	31.22	31.84	33.88	32.31	38.06	37.04	33.97	37.75	38.00	37.19	34.22
Title I	SD	16.08	17.83	17.24	16.28	15.32	17.44	18.35	16.84	17.83	17.84	17.02	15.44
– – –●	N	1709	1665	1650	1578	1415	1436	1360	1276	1653	1687	1626	1138

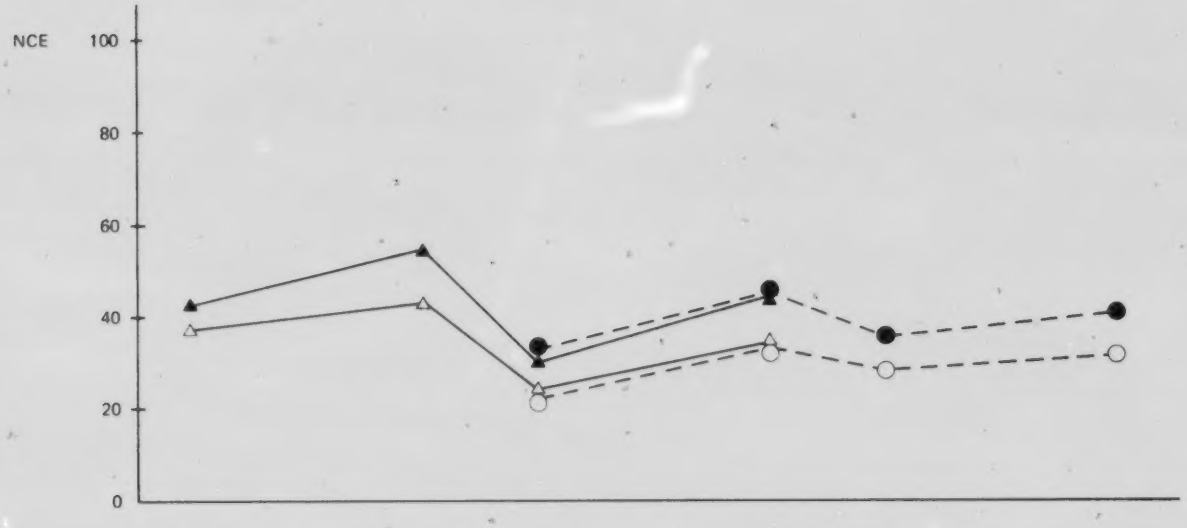
FIGURE 6.9 POST TEST ACHIEVEMENT PROFILES, GRADE 3

		Vocabulary	Reading Comprehension	Reading Total	Language Mechanics	Language Expression	Spelling	Language Total	Math Computation	Math Concepts	Math Applications	Math Total	Battery Total
Non	$\bar{X}$	45.58	45.30	45.37	50.28	46.68	50.54	49.55	49.35	51.01	45.88	48.23	48.43
Title I	SD	16.07	17.05	16.70	19.77	17.29	20.01	18.05	17.94	16.70	17.04	16.63	15.62
——▲	N	588	[illegible]	580	505	514	486	455	580	564	540	556	427
	$\bar{X}$	32.55	32.81	31.55	33.80	33.21	36.58	33.56	[illegible]	37.74	35.47	37.74	34.10
Title I	SD	13.27	14.55	13.85	17.30	14.97	17.41	15.43	16.27	15.56	14.76	14.88	13.95
– – –●	N	1645	[illegible]	1619	1460	1495	1392	1281	[illegible]	1584	1506	1565	1172

Data for the reading total and the mathematics total subscales, from a longitudinal data base, are presented in Figures 6.10 and 6.11. The students whose mean NCE scores are presented in these figures are those for whom all achievement records from the pre and post testing of both the 1975-76 and the 1976-77 academic years could be matched with their student information sheets for both years. The data presented in Figures 6.10 and 6.11 are derived from two groups of students. The first group of students was in the first grade during the 1975-76 academic year, and in the second grade during the 1976-77 academic year. The second group of students was in the second and then the third grade during these years. Because the data from the two groups overlap at the second grade, the presentation of the data from both groups in one figure provides an opportunity to assess the degree of similarity in achievement profiles. The observed similarity between the achievement profiles of the two longitudinal groups at grade 2 suggests that the longitudinal data do indeed present a reasonably accurate profile of the achievement scores as they change over time.

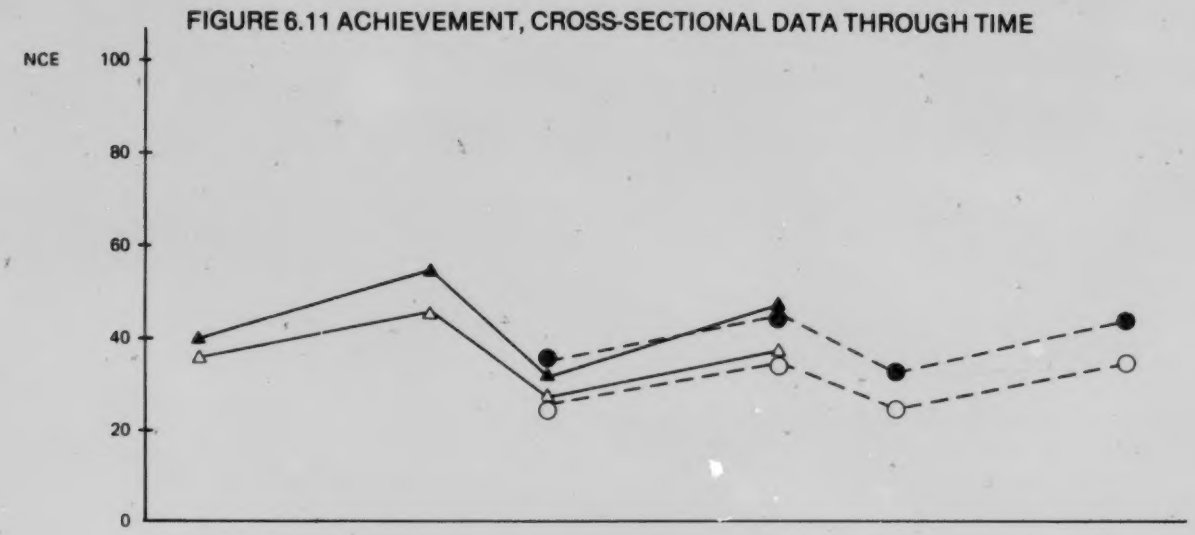
A striking feature of these figures is that, on the whole, academic progress is made during the year when the performance of the students is compared to what might be expected of them relative to national norms used in the tests. The average national percentile ranking or relative standing of both Title I and non-Title I students increases during the school year in reading and mathematics at each of the grades for which longitudinal data are available. The achievement gains revealed by the longitudinal data are essentially the same as the gains that have been discussed previously.

FIGURE 6.10 READING ACHIEVEMENT, CROSS-SECTIONAL DATA THROUGH TIME



		Pre Grade 1	Post Grade 1	Pre Grade 2	Post Grade 2	Pre Grade 3	Post Grade 3
Non Title 1 ——▲	$\bar{X}$	42.47	54.27	29.92	45.10		
	SD	20.86	13.89	16.39	17.72		
	N	287	289	290	300		
Title 1 ——△	$\bar{X}$	37.53	43.35	24.03	34.72		
	SD	17.92	16.11	13.88	17.84		
	N	477	487	473	499		
Non Title 1 – – –●	$\bar{X}$			32.89	45.61	36.31	41.16
	SD			17.86	16.46	15.72	15.26
	N			261	267	268	268
Title 1 – – –○	$\bar{X}$			22.65	33.67	28.22	32.17
	SD			13.08	15.82	13.30	15.64
	N			412	407	429	426

FIGURE 6.11 ACHIEVEMENT, CROSS-SECTIONAL DATA THROUGH TIME



		Pre Grade 1	Post Grade 1	Pre Grade 2	Post Grade 2	Pre Grade 3	Post Grade 3
Non Title 1 ——▲	$\bar{X}$	39.41	54.38	32.00	47.46		
	SD	18.14	18.28	14.44	18.36		
	N	273	297	300	300		
Title 1 ——△	$\bar{X}$	36.55	45.99	27.62	37.77		
	SD	17.07	19.41	15.06	18.12		
	N	473	482	478	503		
Non Title 1 — — —●	$\bar{X}$			35.27	46.72	32.48	44.04
	SD			15.89	16.76	15.9	16.78
	N			260	264	263	267
Title 1 — — —○	$\bar{X}$			26.64	34.95	24.62	35.30
	SD			14.76	17.61	12.52	16.05
	N			406	416	412	422

The longitudinal data also indicate that the non-Title I students generally tend to gain at a slightly faster rate than Title I students. The separation between the average pretest scores of Title I and non-Title I students is less than the separation of their average posttest scores. This feature is most evident at grade 1, and the degree of separation decreases in grades 2 and 3. These qualitative features of the longitudinal data are important corroborations of features of the average gains in achievement scores discussed in an earlier section.

An additional feature of Figures 6.10 and 6.11 is the "summer loss" phenomenon. This phenomenon has been observed in a variety of situations throughout the United States, and is a pattern of academic improvement during the school year followed by a loss occurring over the summer months (as measured by standardized tests). In Figures 6.10 and 6.11 a summer loss can be observed on the average for both Title I and non-Title I students in both reading and mathematics.

The pattern of summer loss is more consistent for mathematics than for reading, with a uniform summer loss occurring in all the grades for which there are data. It is interesting to notice that the absolute level of mean summer loss in mathematics after grades 1 and 2 is less for Title I students than for non-Title I students. The average summer loss in mathematics is greater than the previous year's average academic improvement for both Title I and non-Title I students after grades 1 and 2. The average summer loss in reading is greater than the previous year's academic improvement only after grade 1, for both Title I and non-Title I students.

The result of the summer loss in mathematics is that on a yearly basis both Title I and non-Title I students are losing ground in mathematics when they are compared with national norms. In reading the major summer loss occurs between grades 1 and 2. Although a good partial recovery occurs during grade 2, there is a cumulative decline in the mean score level from the end of kindergarten to the end of the third grade. One possible source of the summer loss could be an association of influences arising from the students' background and characteristics, or from the students' summer experience. Another possible source of the summer loss could originate in the educational process itself. Aspects of educational style and content, as well as their interaction with student values, attitudes, and motivations, may each have a profound impact on the student's educational success.

A third possible "explanation" or source of the "summer loss" is the nature of the tests that are used to measure the levels of achievement before and after each summer. It has recently been suggested that summer losses may be due largely to an artifact of the test norming process.[6.11] It is possible that the construction of the CTBS test norms that were available for the 1976-77 data does affect the data in such a way that the reported changes in score level over the summer are inaccurate.

The norms that were available for this evaluation are based upon a norming group that was tested in the spring. The fall norms were established from the spring norming group by projecting theoretical growth curves from spring to spring, and deriving the fall norms from these projected growth curves. As a result, the fall test score percentiles reflect not just the performance of the students, but also the choice of the growth curves that were used to establish the fall norms.

It is possible that the test norms affected the fall achievement test scores in such a manner that the "summer losses" were indicated as being larger than they really were. If this were true, however then the achievement gains during the school year would be smaller than they were reported to be. The differences between the real and reported summer losses could be balanced by similar differences between the real and the reported school year gains.

POSTTEST ACHIEVEMENT, STUDENT CHARACTERISTICS AND TITLE I PROGRAM PARTICIPATION

In order to determine whether or not there are significant and educationally relevant differences between the Title I and non-Title I students which affect their levels of mean posttest achievement scores, a series of analyses were conducted. Those analyses utilized regression models to predict posttest achievement scores on the basis of various selected variable sets. The predictor variable sets reflect the effect of pretest achievement scores, Title I program participation, and individual characteristics as reported by teachers on the Student Information Form.

These analyses were designed to allow the variation in the posttest scores to be partitioned into percentages of variance which could be uniquely associated with the separate variable sets and with all combinations of the variable sets considered. This methodology should be used only when two limitations are kept in mind.

The first limitation is that what the variable sets themselves represent must be understood in order to interpret what the percentages of the variance of the achievement scores are associated with. This is particularly important when considering the variables derived from the Student Information Form (SIF). The variable set derived from the SIF should be regarded primarily as a general indication of differences among students. The SIF was completed by the teachers and not the students, so that the SIF represents the teacher's impression or judgment about the student's characteristics.

A second limitation is that when regression methods are being used, the relative importance of a variable or variable set can change depending upon the total context of variables that are used in an analysis. In particular, a variable can be significant in one analysis, but when additional variables are introduced for further analysis, the original variable can diminish in relative significance because the new variables could be correlated with it. Interpretations should be proposed with the understanding that it is possible that the total variable set used is not a complete or optimal representation of all the factors that are significant in association with the outcome of interest.

The overall percentages of variance in the posttest achievement scores that are associated with selected variable sets are presented in Table 6.3. The percentages of variance in the posttest achievement scores that are uniquely associated with each variable set and each combination of variable sets are presented in Table 6.4. The results presented in Table 6.4 are derived from those in 6.3. For example, in Table 6.3, for the grade 1 reading results, the SIF variable set is indicated as being associated with 41.6 percent of the variation in the posttest reading scores. This complete percentage of variance is not uniquely associated with just the SIF variable set because the SIF variables are themselves associated with the pretest achievement scores and with Title I program participation.

In Table 6.4 the SIF is indicated as being uniquely associated with 21.3 percent of the grade 1 posttest reading achievement variance. The difference in the percentages of variance which is uniquely associated with the posttest score (21.3) and the compounded association (41.6) are combinations of the SIF variables and just the pretest (11.8 percent), the SIF variables and just the Title I indicant (3.3 percent), and the SIF variables with both the pretest and the Title I indicant (5.2 percent). The total of the percentage of variance uniquely associated with just the SIF and the percentages of variance uniquely associated with the SIF in association with other variable sets is equal to the percentage of overall variance that is associated with the SIF variable set.

TABLE 6.3 OVERALL PERCENTAGE OF ACHIEVEMENT VARIANCE (100 R^2) ASSOCIATED WITH SELECTED VARIABLE SETS

	Grade 1		Grade 2		Grade 3	
	Read	Math	Read	Math	Read	Math
Pretest	25.6	22.2	38.9	36.0	43.1	37.4
Title	9.0	8.2	11.8	9.3	11.7	9.1
SIF	41.6	31.9	42.8	32.4	39.5	34.5
Pretest & Title	29.2	25.5	41.8	38.2	45.3	38.9
Pretest & SIF	50.2	39.3	54.9	45.9	54.9	48.5
SIF & Title	42.1	32.6	43.8	33.3	41.2	35.5
Pretest, Title & SIF	50.5	39.6	55.4	46.4	55.5	48.7

The results of interest are the percentages of variance in the posttest achievement scores that are uniquely associated with the selected variable sets, as presented in Table 6.9. With these results, and within the total variable pool being considered, the relative significance of the association between posttest achievement and various potential casual influences represented by the variable sets can be established. The most significant influence for reading at the first and second grade, and for math at the first grade, is the influence of individual student characteristics, as represented by the SIF variable pool. The most significannt influence for reading at the third grade, and for math at the second and third grades, is the pretest level of achievement.

TABLE 6.4 PERCENTAGES OF ACHIEVEMENT VARIANCE UNIQUELY ASSOCIATED WITH SELECTED VARIABLE SETS.

	Grade 1		Grade 2		Grade 3	
	Read	Math	Read	Math	Read	Math
Pretest	84.0	7.0	11.60	13.10	14.3	13.2
Title	0.30	0.30	0.50	0.5	0.6	0.2
SIF	21.30	14.10	13.60	8.20	10.2	9.8
Pretest & Title	0.20	0.40	0.50	0.40	1.1	
Pretest & Title	0.20	0.40	0.50	0.40	1.1	0.8
Pretest & SIF	11.80	10.30	18.40	15.80	19.3	16.6
SIF & Title	3.30	3.00	2.40	1.70	1.6	1.3
Pretest, SIF & Title	5.20	4.50	8.40	6.7	8.4	6.8
Total	50.5	39.6	55.4	46.4	55.5	48.7

Variable Sets:

Pretest = pretest reading and math scores, their squares, and their product were all used for predicting both reading and math posttest scores.

Title = a dummy variable representing Title I program participation.

SIF = sets of dummy variables for each of the following questions from the Student Information Form; sex, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10.

The total of the unique percentages of variance in the posttest achievement scores that are associated with these two influences and their combination or interaction is between 30 percent and 43 percent. The percentage of variance that is uniquely associated with the Title I indicant, or whether or not a student was eligible for the Title I program is less than 1 percent, for all the grades and for both reading and mathematics. The percentage of variance that is uniquely associated with just the SIF variable set ranges from 8 percent to 21 percent. The percentage of variance that is uniquely associated with just the pretest score ranges from 7 to 14 percent.

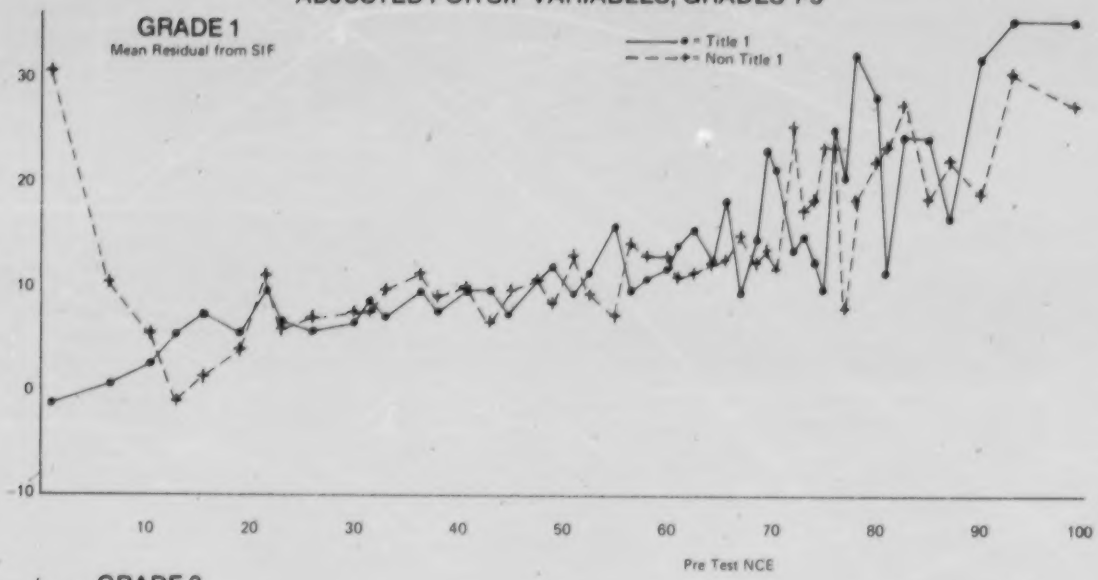
It must be concluded that overall, the SIF variables representing individual characteristics are at least as important in association with differences in posttest achievement scores as the level of pretest achievement. In particular, individual differences are more important in the first grade for both reading and mathematics, and in the second grade for reading. The most important single influence in the third grade for both reading and math, and in the second grade in mathematics, is the level of pretest achievement.

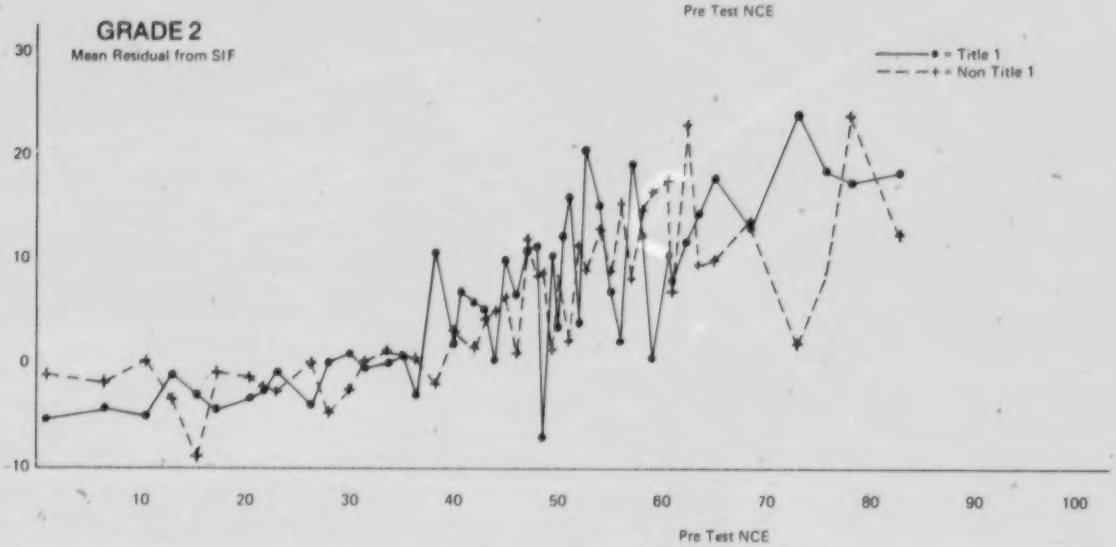
The impact of the SIF variable set on the posttest achievement scores is graphically presented in Figures 6.12 and 6.13. To obtain these figures, the posttest achievement scores were first predicted just on the basis of variables derived from the SIF variable set. That part of the posttest achievement scores that could not be predicted on the basis of the SIF variable set was then calculated as the difference of the observed achievement score and the score predicted on the basis of SIF characteristics. After the impact of the SIF variables was removed by this procedure, the residual achievement score was then empirically regressed upon the level of pretest achievement score, separately for Title I and non-Title I students, and for grades 1-3 in both reading and mathematics. Figures 6.12-6.13 present these regression curves for the mean residual achievement score after adjusting for the SIF variables, just as Figures 6.14-6.15 present the regression curves for the mean achievement score without this adjustment. Tables 6.5-6.10 are the source tables for the data displayed graphically in Figures 6.12-6.15.

The difference between the first and second sets of figures is that the unadjusted mean achievement scores still reflect differences in the individual characteristics of the students, and to the extent that educationally relevant differences between students are reflected in the SIF variable set, the mean residual achievement scores have the effects of these differences removed. This suggests that the mean residual achievement scores for the two groups can be compared as reflecting the academic situation of Title I and non-Title I students with at least some of the effect of differences in individual characteristics removed from consideration. It must be remembered that the variable set derived from the SIF does not completely represent all or even many of the possible individual characteristics that might act as determinants of academic achievement, so that it must be assumed that there is some effect of individual characteristics that has not been removed by the procedure outlined above.

Figures 6.12-6.13 must be interpreted, and compared with Figures 6.14-6.15, with an understanding and knowledge of the procedure that was used to generate these figures and of the limitations of the SIF variable set. There is an immediately apparent fundamental contrast between these two sets of figures. As shown in Figures 6.14-6.15, throughout the pretest score range where stable and reliable estimates of the mean achievement scores are available, there is a consistent and uniform pattern of non-Title I students having higher mean posttest achievement scores than Title I students, even after the effect of differences in pretest achievement level has been removed. However, when the effect of differences of individual characteristics as reflected in the SIF variables has been removed, the overall pattern of non-Title I students consistently having higher posttest achievement scores than Title I students is no longer apparent. As indicated in Figures 6.12-6.13, throughout the range of pretest scores there is instability in the relationship of the mean posttest achievement scores for the two groups. First one group will have a higher score, and then the other group will have a higher score. There is no pretest score range where one group or the other predominates. This pattern of instability suggests that further analysis should be conducted to determine any casuality.

FIGURE 6.12 MEAN RESIDUAL READING ACHIEVEMENT SCORES ADJUSTED FOR SIF VARIABLES, GRADES 1-3





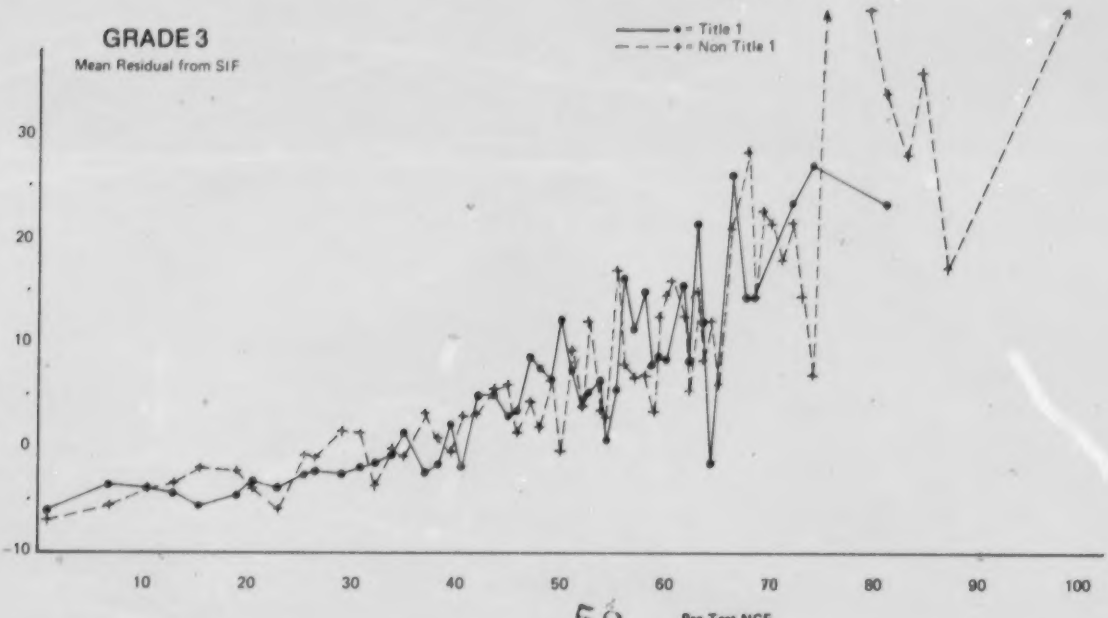


TABLE 6.5 POST TEST READING MEANS BROKEN OUT BY PRE TEST PERCENTILE, GRADE 1

Pre Test		Title 1					Non Title 1				
Percentile	NCE	N	% of Group	Post Test Reading $\bar{X}$	SD	Mean Residual From SIF	N	% of Group	Post Test Reading $\bar{X}$	SD	Mean Residual From SIF
	Missing Cases	431	20.74				121	14.85			
1	1.0	32	1.54	24.87	14.90	−11.28	1	0.12	75.00		20.65
2	6.7	15	0.72	29.00	12.50	−9.20	4	0.49	52.00	15.08	0.29
3	10.4	26	1.25	33.85	20.54	−7.22	2	0.25	31.50	30.41	−4.67
4	13.1	20	0.96	35.10	19.30	−4.29	5	0.61	31.40	23.01	−11.02
5	15.4	49	2.36	30.12	14.83	−2.78	5	0.61	31.80	22.64	−8.74
7	18.9	65	3.13	36.54	19.52	−4.62	14	1.72	40.57	16.32	−5.87
9	21.8	54	2.60	41.19	15.35	−0.36	22	2.70	50.14	17.59	1.06
11	23.0	102	4.91	35.96	17.13	−3.21	26	3.19	48.19	15.45	−3.93
13	26.3	98	4.72	35.80	17.18	−4.36	20	2.45	48.75	17.64	−2.90
17	29.9	94	4.52	36.02	19.08	−3.60	25	3.07	48.08	10.31	−2.47
19	31.5	105	5.05	39.03	16.93	−1.21	29	3.56	43.97	16.07	−2.65
22	33.7	104	5.00	39.93	17.41	−2.90	32	3.93	49.81	17.68	−0.07
26	36.5	85	4.09	42.00	15.80	−0.23	28	3.44	48.89	18.32	1.11
29	38.3	88	4.23	39.86	18.55	−2.19	29	3.56	51.97	10.78	−0.96
33	40.7	71	3.42	41.69	16.72	−0.40	34	4.17	48.44	19.32	0.00
37	43.0	73	3.51	41.89	17.15	0.30	30	3.68	48.00	16.50	−3.42
40	44.7	65	3.13	40.66	16.14	−2.81	23	2.82	53.26	16.17	−0.25
45	47.4	69	3.32	43.17	16.31	0.78	26	3.19	51.31	16.70	0.40
48	48.9	46	2.21	47.37	14.01	2.01	23	2.82	53.43	13.70	−1.57
52	51.1	43	2.07	40.93	17.74	−0.83	30	3.68	57.30	9.99	2.97
55	52.6	43	2.07	46.21	14.14	1.23	17	2.09	51.94	14.84	−0.52
59	54.8	36	1.73	50.55	14.73	6.03	14	1.72	50.50	15.14	−2.76
62	56.4	24	1.15	45.75	13.73	−0.35	16	1.96	54.62	14.03	4.27
65	58.1	23	1.11	48.91	17.24	0.91	14	1.72	57.86	14.81	2.93
68	59.9	31	1.49	47.58	15.56	1.77	28	3.44	59.68	10.51	3.07
70	61.0	26	1.25	47.81	16.44	3.96	13	1.60	58.77	13.22	0.98
72	62.3	18	0.87	53.56	16.23	5.65	16	1.96	57.75	11.02	1.67
75	64.2	18	0.87	46.78	12.16	2.48	11	1.35	60.09	9.30	2.75
77	65.6	16	0.77	53.81	13.55	8.24	10	1.23	57.80	11.53	2.57
79	67.0	16	0.77	42.50	14.71	−0.61	16	1.96	63.12	13.79	4.92
81	68.5	10	0.48	53.20	3.26	4.48	9	1.10	57.44	8.29	2.32
82	69.3	9	0.43	57.89	18.34	13.18	15	1.84	57.47	16.40	3.11
83	70.1	10	0.48	58.10	9.06	11.24	6	0.74	55.00	8.65	1.73
85	71.8	8	0.38	57.25	10.70	3.62	10	1.23	65.90	13.49	15.48
86	72.8	6	0.29	53.50	17.87	5.02	7	0.86	64.00	11.63	7.19
87	73.7	6	0.29	52.50	27.67	2.41	8	0.98	66.62	12.89	8.61
88	74.7	8	0.38	52.00	11.74	−0.02	9	1.10	70.56	10.03	13.17
89	75.8	2	0.10	73.50	12.02	14.94	5	0.61	71.20	13.74	13.49
90	77.0	3	0.14	55.33	7.64	10.51	2	0.25	53.00	2.83	−2.03
91	78.2	2	0.10	82.50	4.95	22.30	6	0.74	65.00	9.98	8.44
92	79.6	4	0.19	65.25	24.05	18.37	9	1.10	69.33	13.69	11.72
93	81.1	6	0.29	56.17	14.82	1.44	9	1.10	69.22	7.82	13.50
94	82.7	3	0.14	71.33	15.95	14.52	5	0.61	70.00	3.54	17.52
95	84.6	5	0.24	67.20	15.58	14.21	3	0.37	72.33	8.74	8.69
96	86.9	3	0.14	65.67	8.08	6.64	4	0.49	73.75	9.88	12.05
97	89.6	4	0.19	81.50	5.45	21.88	5	0.61	71.60	7.09	9.01
98	93.3	1	0.05	72.00		25.40	6	0.74	80.33	4.41	20.53
99	99.0	2	0.10	86.00	0.00	25.48	13	1.60	80.62	5.78	17.66

TABLE 6.6 POST TEST READING MEANS BROKEN OUT BY PRE TEST PERCENTILE, GRADE 2

		Title 1					Non Title 1				
Pre Test				Post Test Reading		Mean Residual			Post Test Reading		Mean Residual
Percentile	NCE	N	% of Group	$\bar{X}$	SD	From SIF	N	% of Group	$\bar{X}$	SD	From SIF
	Missing Cases	208	11.65				59	8.60			
1	1.0	66	3.70	26.77	16.16	−5.38	15	2.19	41.27	10.18	−1.01
2	6.7	106	5.94	27.87	13.52	−4.42	19	2.77	39.26	15.05	−1.96
3	10.4	86	4.82	27.57	14.08	−5.03	12	1.75	36.83	18.26	0.33
4	13.1	88	4.93	30.48	13.19	−1.86	25	3.64	37.68	10.99	−3.13
5	15.4	26	6.55	30.56	15.54	−2.99	23	3.35	36.13	14.66	−9.05
6	17.3	111	6.22	18.32	14.18	−4.30	26	3.79	40.65	17.01	−0.89
8	20.4	107	5.99	31.32	14.86	−3.25	26	3.79	40.65	13.40	−1.25
9	21.8	135	7.56	31.42	14.34	−2.80	27	3.94	42.96	14.28	−2.68
11	23.0	126	7.05	33.60	15.16	−0.64	32	4.66	39.91	18.85	−2.61
13	26.3	103	5.77	30.06	14.66	−3.92	28	4.08	44.93	5.70	0.13
15	28.2	94	5.26	35.26	15.95	0.06	21	3.06	40.09	17.82	−4.74
17	29.9	71	3.98	34.65	14.74	1.03	22	3.21	42.45	12.81	−2.34
19	31.5	55	3.08	32.75	16.55	−0.60	30	4.37	44.83	9.13	0.12
22	33.7	59	3.30	36.53	13.44	0.21	22	3.21	47.09	15.17	1.27
24	35.1	42	2.35	39.10	14.35	0.75	14	2.04	48.93	10.85	0.85
26	36.5	26	1.46	33.77	14.65	−2.95	22	3.21	44.82	14.15	0.72
29	38.3	20	1.12	46.65	10.53	10.62	15	2.19	46.80	15.62	−1.99
31	39.6	16	0.90	43.75	15.65	1.96	10	1.46	50.40	7.75	3.20
33	40.7	11	0.62	51.00	12.26	7.08	17	2.48	49.47	19.99	2.43
35	41.9	16	0.90	47.56	9.97	5.96	11	1.60	49.09	8.37	1.58
37	43.0	6	0.34	46.00	7.64	5.29	8	1.17	52.37	13.20	4.42
39	44.1	13	0.73	43.08	14.58	0.55	12	1.75	55.25	11.14	5.0
41	45.2	14	0.78	55.93	11.34	9.99	9	1.31	55.22	9.38	6.62
43	46.3	5	0.28	56.80	18.51	6.71	7	1.02	52.57	10.34	1.05
44	46.8	9	0.50	49.22	7.98	0.97	6	0.87	62.00	7.10	12.09
46	47.9	4	0.22	41.00	21.15	1.37	10	1.46	62.60	5.38	8.32
47	48.4	2	0.11	46.50	7.78	−6.90	11	1.60	58.73	7.91	8.76
49	49.5	3	0.17	53.33	13.61	10.35	4	0.58	50.50	21.49	1.26
50	50.0	7	0.39	52.00	11.86	3.80	3	0.44	58.33	9.81	8.66
51	50.5	8	0.45	54.50	10.77	12.52	3	0.44	54.67	7.51	2.32
52	51.1	6	0.34	57.83	6.62	16.19	3	0.44	66.00	17.09	11.24
54	52.1	6	0.34	52.67	3.88	3.84	14	2.04	57.64	9.48	9.06
55	52.6	3	0.17	64.33	11.24	20.67	4	0.58	65.25	10.31	13.66
57	53.7	5	0.28	59.20	9.31	15.22	12	1.75	62.17	12.45	8.83
58	54.2						3	0.44	65.67	7.64	15.47
60	55.3	4	0.22	56.75	3.20	6.97	13	1.90	63.46	9.96	8.32
61	55.9	2	0.11	51.00	18.38	2.32	7	1.02	64.71	8.56	14.83
63	57.0	4	0.22	66.25	1.50	19.33	8	1.17	67.37	8.70	16.61
65	58.1	4	0.22	68.50	1.73	12.23	4	0.58	67.50	10.60	17.66
66	58.7	1	0.06	62.00		0.43	4	0.58	64.00	9.63	6.70
67	59.3						5	0.73	76.20	4.09	22.93
69	60.4	3	0.17	74.00	8.66	11.04	8	1.17	65.62	5.45	9.56
70	61.0	4	0.22	63.00	8.37	7.97	7	1.02	65.43	4.39	9.93
72	62.3	1	0.06	70.00		11.76	8	1.17	68.87	9.03	13.34
74	63.5	1	0.06	74.00		14.45	3	0.44	68.00	3.46	1.93
76	64.9	2	0.11	74.50	6.36	18.01	2	0.29	68.50	2.12	8.71
78	66.3						7	1.02	74.43	7.87	24.05
81	68.5	1	0.06	74.00		12.90	5	0.73	67.80	15.19	12.51
84	70.9						7	1.02	71.86	5.76	15.47
86	72.8	2	0.11	72.00	2.83	23.92	1	0.15	84.00		33.05
89	75.8	1	0.06	79.00		18.45	6	0.87	78.17	3.76	20.35
91	78.2	1	0.06	64.00		17.56	1	0.15	84.00		25.08
94	82.7	1	0.06	64.00		18.46	2	0.29	72.00	2.83	10.68
96	86.9						2	0.29	81.50	3.54	18.58
99	99.0						1	0.15	84.00		30.25

TABLE 6.7 POST TEST READING MEANS BROKEN OUT BY PRE TEST PERCENTILE, GRADE 3

Pre Test		Title 1					Non Title 1				
				Post Test Reading		Mean Residual			Post Test Reading		Mean Residual
Percentile	NCE	N	% of Group	$\bar{X}$	SD	From SIF	N	% of Group	$\bar{X}$	SD	From SIF
Missing Cases		104	6.04				26	4.29			
1	1.0	78	4.53	24.69	12.45	−6.19	17	2.81	27.12	10.34	−7.02
2	6.7	54	3.13	27.41	12.42	−3.68	14	2.31	26.43	15.22	−5.67
3	10.4	43	2.50	28.91	13.31	−3.94	10	1.65	32.70	16.82	−4.08
4	13.1	50	2.90	26.34	11.97	−4.30	9	1.49	28.22	13.33	−3.30
5	15.4	65	3.77	24.80	11.18	−5.71	5	0.83	40.20	9.09	−1.96
7	18.9	79	4.59	26.53	10.73	−4.62	15	2.48	35.60	10.55	−2.27
8	20.4	82	4.76	28.82	11.93	−3.31	27	4.46	34.00	15.30	−3.82
10	23.0	107	6.21	26.21	10.74	−3.95	18	2.97	33.11	13.96	−5.84
12	25.3	105	6.09	28.68	12.42	−2.58	15	2.48	34.20	12.80	−0.68
13	26.3	123	7.14	29.93	11.56	−2.25	27	4.46	37.44	18.05	−0.72
16	29.1	97	5.63	29.91	13.12	−2.65	30	4.95	39.87	12.55	1.74
18	30.7	137	7.95	29.87	11.66	−2.08	28	4.62	40.68	9.98	1.41
20	32.3	92	5.34	31.09	11.47	−1.41	19	3.14	37.89	12.43	−3.80
22	33.7	77	4.47	31.06	11.53	−0.76	20	3.30	43.10	18.36	−0.08
24	35.1	63	3.66	36.05	14.72	1.63	20	3.30	39.70	13.99	−0.81
27	37.1	72	4.18	32.56	12.65	−2.46	18	2.97	46.61	11.29	3.27
29	38.3	44	2.55	31.55	11.23	−1.85	24	3.96	42.46	11.31	1.09
31	39.6	38	2.21	36.97	12.61	2.35	17	2.81	44.35	7.81	−0.36
33	40.7	28	1.63	32.43	11.99	−2.07	19	3.14	47.37	19.33	3.07
35	41.9	28	1.63	40.43	11.32	5.04	15	2.48	47.93	8.72	3.27
38	43.6	21	1.22	41.05	14.14	5.16	14	2.31	46.64	11.58	5.60
40	44.7	9	0.52	45.33	9.03	2.92	11	1.82	49.09	6.91	5.92
42	45.8	13	0.75	42.85	12.34	3.39	15	2.48	49.87	8.97	1.66
44	46.8	16	0.93	48.56	8.49	8.74	11	1.82	49.73	10.16	4.57
46	47.9	9	0.52	55.89	18.50	17.75	9	1.49	50.33	8.76	2.04
48	48.9	9	0.52	50.67	10.07	6.56	11	1.82	51.36	5.89	6.48
50	50.0	6	0.35	51.00	6.13	12.37	5	0.83	43.00	16.67	−0.35
52	51.1	8	0.46	48.37	7.78	7.53	7	1.16	55.00	7.81	9.61
54	52.1	4	0.23	43.75	15.09	4.04	8	1.32	51.12	12.84	3.97
55	52.6	4	0.23	54.50	8.89	5.38	9	1.49	58.00	8.82	12.30
57	53.7	6	0.35	50.83	12.35	6.67	8	1.32	54.62	11.60	3.80
58	54.2	7	0.41	44.14	13.17	0.57	12	1.98	55.25	4.61	2.92
60	55.3	5	0.29	49.00	8.80	5.75	5	0.83	64.80	6.30	17.32
61	55.9	4	0.23	57.75	3.69	16.25	7	1.16	60.29	5.96	8.32
63	57.0	2	0.12	58.00	7.07	11.61	7	1.16	54.86	5.40	6.82
65	58.1	2	0.12	52.50	24.75	15.11	4	0.66	54.50	5.97	7.28
66	58.7	4	0.23	53.25	18.21	8.17	4	0.66	54.50	8.43	3.57
67	59.3	5	0.29	58.60	6.19	8.85	3	0.50	61.00	3.46	12.54
68	59.9	2	0.12	50.00	8.49	8.58	4	0.66	59.00	17.01	14.60
69	60.4						7	1.16	65.00	11.75	16.17
71	61.7	1	0.06	74.00		15.76	4	0.66	59.50	14.11	12.69
72	62.3	2	0.12	62.00	5.66	8.66	2	0.33	60.50	4.95	5.52
73	62.9	3	0.17	58.67	11.15	21.51	3	0.50	56.33	5.03	15.01
74	63.5	4	0.23	53.00	12.03	12.12	6	0.99	62.50	7.12	8.44
75	64.2	3	0.17	51.00	6.93	−1.53	4	0.66	61.50	5.80	12.35
76	64.9						3	0.50	60.00	2.65	6.25
78	66.3	2	0.12	75.00	12.73	26.27	7	1.16	69.86	14.54	22.04
80	67.7	2	0.12	58.00	0.00	14.46	4	0.66	73.75	6.40	28.44
81	68.5	1	0.06	49.00		14.36	2	0.33	67.50	4.95	14.69
82	69.3						1	0.17	63.00		22.82
83	70.1						1	0.17	74.00		21.58
84	70.9						1	0.17	52.00		17.84
85	71.8	1	0.06	77.00		23.58	1	0.17	74.00		21.75
86	72.8						1	0.17	71.00		14.59
87	73.7	1	0.06	84.00		27.09	1	0.17	63.00		7.13
88	74.7						1	0.17	99.00		44.34
90	77.0						1	0.17	99.00		43.55
92	79.6						4	0.66	90.50	9.43	42.01
93	81.1	1	0.06	77.00		23.52	1	0.17	84.00		34.06
94	32.7						1	0.17	81.00		28.28
95	84.6						1	0.17	74.00		36.14
96	86.9						1	0.17	66.00		17.28
99	99.0						1	0.17	99.00		44.42

FIGURE 6.13 MEAN RESIDUAL MATHEMATICS ACHIEVEMENT SCORES ADJUSTED FOR SIF VARIABLES GRADES 1-3

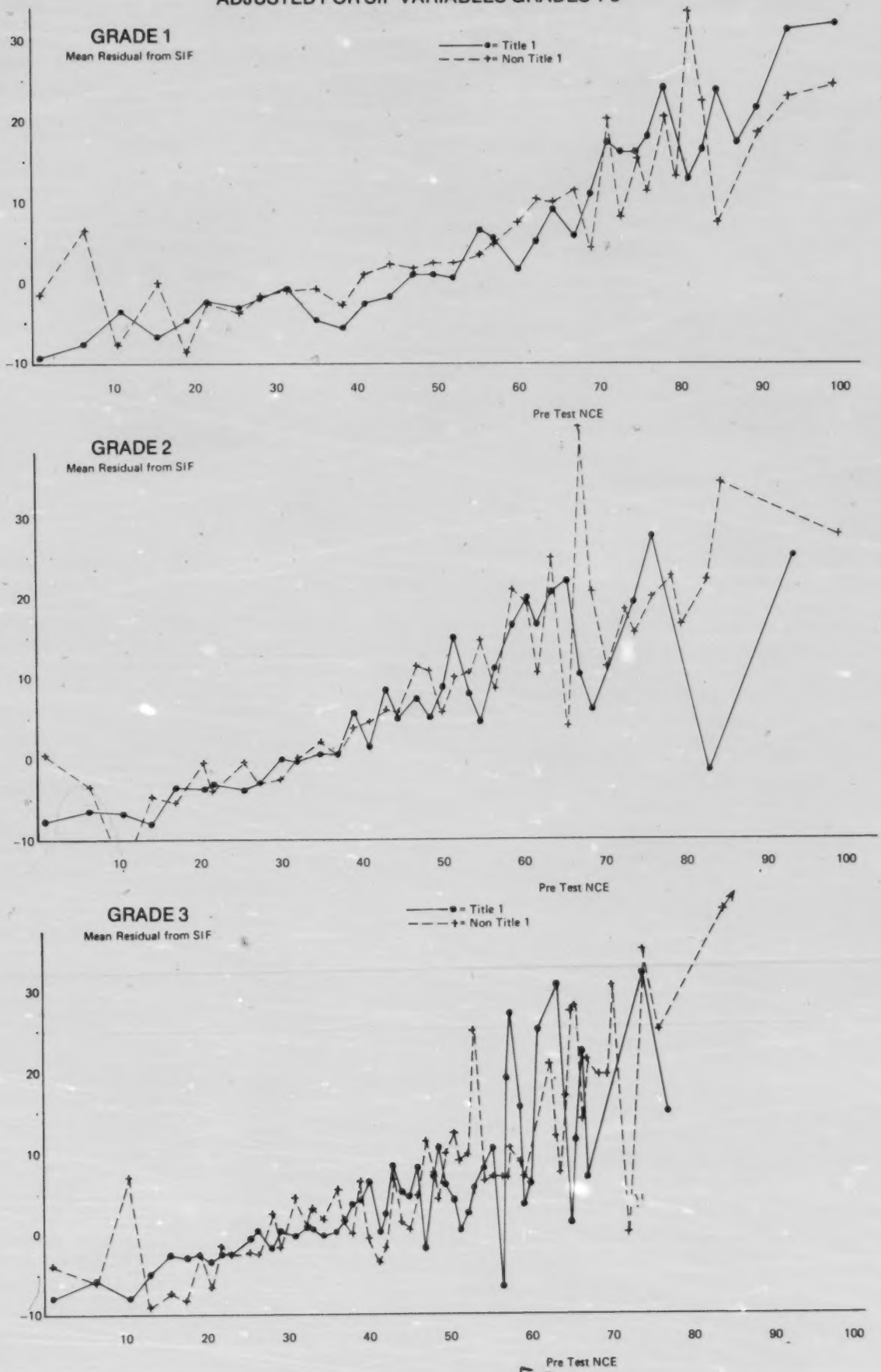


TABLE 6.8 POST TEST MATH MEANS BROKEN OUT BY PRE TEST PERCENTILE, GRADE 1

		Title 1					Non Title 1				
Pre Test Percentile	NCE	N	% of Group	Post Test Math $\bar{X}$	SD	Mean Residual From SIF	N	% of Group	Post Test Math $\bar{X}$	SD	Mean Residual From SIF
Missing Cases		499	24.01				143	17.55			
1	1.0	34	1.64	29.79	19.46	−9.21	9	1.10	41.78	13.15	−1.66
2	6.7	29	1.40	34.24	16.34	−7.62	4	0.49	52.50	20.34	6.54
3	10.4	33	1.59	38.79	20.63	−3.45	6	0.74	47.17	23.86	−7.72
5	15.4	42	2.02	35.55	16.15	−6.71	11	1.35	42.82	10.35	−0.07
7	18.9	58	2.79	39.26	18.27	−4.71	12	1.47	43.42	19.57	−8.61
9	21.8	87	4.19	41.11	19.47	−2.34	28	3.44	52.11	18.48	−2.45
12	25.3	112	5.39	37.69	18.08	−3.16	25	3.07	48.92	17.40	−3.73
15	28.2	128	6.16	40.57	17.24	−2.00	38	4.66	52.24	17.46	−1.77
19	31.5	124	5.97	42.56	19.63	−0.74	36	4.42	52.92	18.34	−1.04
24	35.1	120	5.77	38.15	17.95	−4.58	61	7.48	52.72	15.99	0.82
29	38.3	125	6.02	37.78	17.28	−5.66	57	6.99	49.91	16.79	−2.83
33	40.7	126	6.06	39.86	20.01	−2.67	61	7.48	55.59	17.37	1.12
39	44.1	120	5.77	41.91	20.02	−1.91	39	4.79	57.15	18.13	2.34
44	46.8	95	4.57	46.51	20.50	1.14	51	6.26	54.51	16.61	1.88
49	49.5	83	3.99	46.81	20.64	1.00	27	3.31	58.67	13.01	2.64
54	52.1	71	3.42	46.92	18.49	0.69	30	3.68	59.13	15.76	2.53
60	55.3	49	2.36	52.49	18.90	6.40	21	2.58	59.62	19.44	3.64
63	57.0	34	1.64	56.18	18.03	5.40	33	4.05	61.39	21.76	4.84
68	59.9	26	1.25	51.19	17.12	1.65	20	2.45	66.20	17.46	7.53
72	62.3	21	1.01	55.67	21.23	5.04	18	2.21	66.78	18.75	10.24
75	64.2	22	1.06	61.05	14.87	9.23	16	1.96	70.56	14.83	9.99
79	67.0	8	0.38	56.12	15.93	5.83	10	1.23	74.80	12.44	11.63
82	69.3	7	0.34	62.57	16.54	11.00	13	1.60	67.08	15.41	4.33
84	70.9	5	0.24	68.40	25.73	17.57	9	1.10	80.67	14.19	20.20
86	72.8	2	0.10	70.00	0.00	16.29	5	0.61	72.60	5.55	8.17
88	74.7	7	0.34	73.00	22.77	16.07	6	0.72	81.00	12.17	15.22
89	75.8	1	0.05	82.00		17.93	5	0.61	71.00	13.04	11.25
91	78.2	2	0.10	72.00	4.24	24.37	3	0.37	81.33	19.14	20.52
92	79.6						3	0.37	77.33	10.21	13.10
93	81.1	1	0.05	62.00		12.91	2	0.25	83.50	7.78	33.66
94	82.7	1	0.05	82.00		16.44	2	0.25	81.00	11.31	22.52
95	84.6	1	0.05	82.00		23.88	2	0.25	79.50	6.36	7.44
96	86.9	1	0.05	68.00		17.34					
97	89.6	1	0.05	89.00		21.60	5	0.61	83.40	5.86	18.66
98	93.3	2	0.10	90.50	12.02	31.33	2	0.25	89.00	0.00	23.05
99	99.0	1	0.05	84.00		32.00	2	0.25	94.00	7.07	28.42

TABLE 6.9 POST TEST MATH MEANS BROKEN OUT BY PRE TEST PERCENTILE, GRADE 2

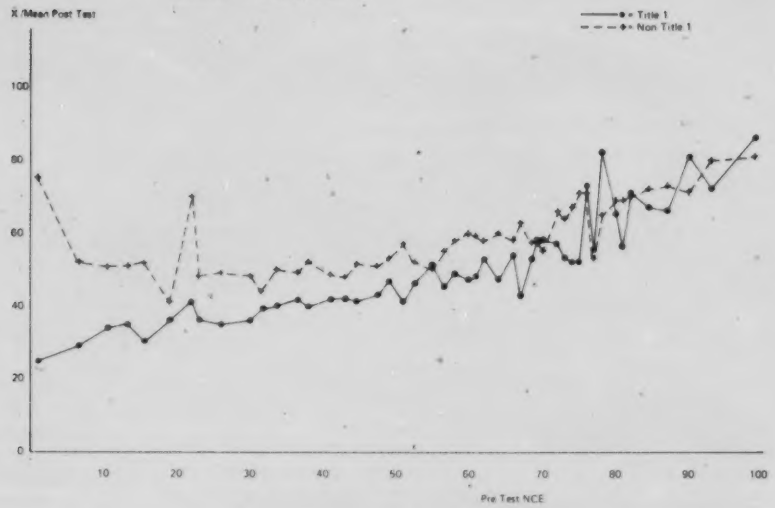
		Title 1					Non Title 1				
Pre Test Percentile	NCE	N	% of Group	Post Test Math $\bar{X}$	Post Test Math SD	Mean Residual From SIF	N	% of Group	Post Test Math $\bar{X}$	Post Test Math SD	Mean Residual From SIF
Missing Cases		160	8.96				53	7.73			
1	1.0	84	4.70	26.80	14.60	−7.72	14	2.04	41.64	10.05	0.50
2	6.7	57	3.19	28.04	17.27	−6.45	8	1.17	42.50	13.47	−3.58
3	10.4	76	4.26	28.53	16.25	−6.75	14	2.04	30.21	19.61	−13.65
4	13.1	88	4.93	27.66	17.35	−7.97	21	3.06	39.90	14.79	−4.81
6	17.3	123	6.89	32.15	15.32	−3.53	26	3.79	36.65	12.42	−5.37
8	20.4	136	7.61	32.33	15.73	−3.72	23	3.35	43.13	13.31	−0.38
9	21.8	121	6.77	35.17	14.61	−3.22	31	4.52	41.77	16.15	−4.09
12	25.3	133	7.45	32.99	15.35	−3.87	34	4.96	44.79	19.63	−0.47
14	27.2	120	6.72	34.46	13.84	−2.99	35	5.10	43.20	12.19	−2.97
17	29.9	132	7.39	38.80	13.37	−0.05	48	7.00	46.33	17.77	−2.43
20	32.3	99	5.54	38.37	16.39	−0.34	32	4.66	51.72	13.69	0.02
24	35.1	77	4.31	40.56	13.53	0.67	32	4.66	51.81	18.69	2.03
27	37.1	77	4.31	41.53	15.87	0.45	27	3.94	49.70	16.16	0.28
30	39.0	41	2.30	45.63	11.84	5.80	33	4.81	55.06	15.05	3.84
33	40.7	42	2.35	45.95	13.47	1.61	32	4.66	53.69	16.65	4.61
37	43.0	49	2.74	50.49	14.05	8.62	29	4.23	57.28	14.27	6.16
40	44.7	29	1.62	47.52	14.01	4.92	22	3.21	57.18	15.20	5.81
44	46.8	27	1.51	52.37	11.18	7.60	21	3.06	62.67	17.81	11.29
47	48.4	18	1.01	51.11	13.08	5.07	29	4.23	62.59	10.91	10.90
50	50.0	20	1.12	51.25	9.24	8.71	11	1.60	59.18	15.50	5.76
53	51.6	18	1.01	60.67	15.40	15.02	16	2.33	60.25	9.94	10.01
56	53.2	14	0.78	55.43	13.66	7.94	21	3.06	63.43	13.01	10.47
59	54.8	5	0.28	52.40	13.56	4.46	8	1.17	67.12	12.92	14.68
62	56.4	12	0.67	60.50	9.41	11.16	13	1.90	66.00	12.18	8.66
66	58.7	8	0.45	63.37	13.63	16.44	11	1.60	78.36	13.38	20.89
69	60.4	6	0.34	65.83	10.11	19.87	4	0.58	76.00	8.04	18.90
71	61.7	3	0.17	67.33	13.20	16.48	6	0.87	63.33	12.18	10.44
74	63.5	1	0.06	56.00		20.47	6	0.87	75.67	5.50	24.84
77	65.6	2	0.11	73.00	8.49	22.18	3	0.44	60.00	13.08	4.08
79	67.0	2	0.11	60.50	9.19	10.21	1	0.15	89.00		40.92
81	68.5	1	0.06	51.00		−3.98	4	0.58	75.75	13.99	20.54
83	70.1						3	0.44	64.00	12.17	11.28
86	72.8						1	0.15	79.00		18.23
87	73.7	1	0.06	51.00		19.33	2	0.29	76.00	24.04	15.50
89	75.8	2	0.11	76.00	24.04	27.58	2	0.29	82.00	0.00	19.93
91	78.2						3	0.44	80.00	8.54	22.75
92	79.6						1	0.15	54.00		16.36
94	82.7	1	0.06	63.00		−1.70	4	0.58	78.50	4.04	22.07
95	84.6						1	0.15	89.00		34.40
98	93.3	1	0.06	89.00		25.11					
99	99.0						1	0.15	89.00		27.46

TABLE 6.10 POST TEST MATH MEANS BROKEN OUT BY PRE TEST PERCENTILE, GRADE 3

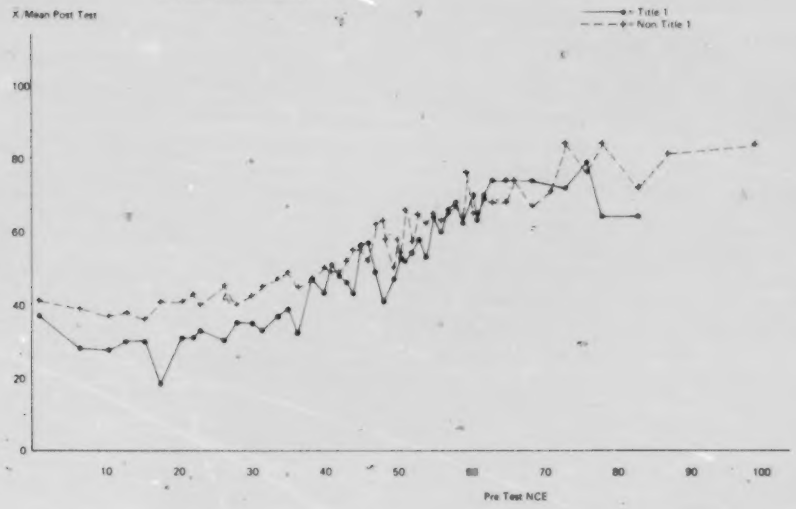
		Title 1					Non Title 1				
Pre Test				Post Test Math		Mean			Post Test Math		Mean
Percentile	NCE	N	% of Group	$\bar{X}$	SD	Residual From SIF	N	% of Group	$\bar{X}$	SD	Residual From SIF
Missing Cases		158	9.17				50	8.25			
1	1.0	74	4.29	25.78	12.21	−7.86	8	1.32	34.37	12.19	−3.79
2	6.7	80	4.64	27.54	14.66	−6.07	13	2.15	32.92	16.05	−6.19
3	10.4	42	2.44	25.48	11.70	−7.59	3	0.50	43.33	22.19	7.09
4	13.1	114	6.62	28.99	12.22	−4.97	10	1.65	30.20	13.11	−9.09
5	15.4	60	3.48	32.22	15.25	−2.77	20	3.30	37.20	10.02	−7.24
6	17.3	62	3.60	32.69	13.20	−2.92	18	2.97	33.78	14.62	−7.20
7	18.9	71	4.12	31.59	13.94	−2.38	12	1.98	36.08	13.13	−2.63
8	20.4	97	5.63	32.47	12.97	−3.41	17	2.81	34.47	7.21	−6.44
9	21.8	80	4.64	33.07	12.91	−2.69	10	1.65	38.30	9.29	−1.67
10	23.0	84	4.88	34.21	13.84	−2.54	16	2.64	37.81	11.58	−2.57
12	25.3	88	5.17	34.62	12.87	−0.80	10	1.65	39.20	10.63	2.22
13	26.3	87	5.05	36.18	14.35	0.57	25	4.13	40.20	12.95	−2.62
15	28.2	66	3.83	33.36	12.41	−1.99	22	3.63	46.95	18.32	2.38
16	29.1	49	2.84	39.00	12.36	0.33	23	3.80	41.87	12.75	−1.77
18	30.7	60	3.48	36.53	12.08	−0.08	17	2.81	49.00	19.02	4.45
20	32.3	59	3.42	38.88	13.86	0.77	15	2.48	42.27	12.88	0.96
21	33.0	54	3.13	39.26	11.60	0.62	18	2.97	46.39	10.98	3.13
23	34.4	39	2.26	39.49	12.94	−0.14	15	2.48	43.07	9.84	1.82
25	35.8	39	2.26	41.15	15.14	0.16	16	2.64	50.94	9.31	5.39
26	36.5	31	1.80	41.81	12.32	1.47	17	2.81	49.76	16.91	1.81
28	37.7	24	1.39	42.46	13.23	3.57	22	3.63	46.68	17.23	0.03
30	39.0	18	1.04	44.17	10.86	3.97	13	2.15	53.54	7.17	6.50
32	40.1	23	1.33	47.04	10.87	6.54	9	1.49	46.22	8.45	−0.46
34	41.3	19	1.10	45.37	11.16	0.09	18	2.97	43.06	10.81	−3.57
35	41.9	16	0.93	45.19	12.29	2.25	10	1.65	52.40	10.51	−1.79
37	43.0	11	0.64	48.82	14.04	8.21	9	1.49	55.89	11.14	6.72
39	44.1	16	0.93	46.87	20.67	5.04	13	2.15	51.00	8.47	1.54
41	45.2	8	0.46	47.50	11.34	4.47	7	1.16	49.86	11.52	0.44
42	45.8	13	0.75	51.15	10.38	8.11	4	0.66	56.50	1.00	4.87
44	46.8	10	0.58	41.00	13.04	−2.03	14	2.31	58.43	9.52	11.22
46	47.9	11	0.64	52.55	13.44	7.05	9	1.49	53.22	7.90	7.44
47	48.4	4	0.23	56.25	11.62	10.25	12	1.98	53.83	6.64	4.16
49	49.5	4	0.23	53.75	10.63	6.03	10	1.65	56.30	13.76	9.83
51	50.5	7	0.41	45.43	7.48	4.22	10	1.65	63.00	12.70	12.15
53	51.6	2	0.12	57.00	4.24	0.36	6	0.99	59.17	5.08	8.85
54	52.1	1	0.06	44.00		2.63	6	0.99	61.67	21.46	9.78
56	53.2	7	0.41	52.29	13.80	5.71	3	0.50	75.33	20.55	25.20
58	54.2	8	0.46	52.12	10.38	7.99	14	2.31	59.57	17.21	6.38
60	55.3	6	0.35	53.33	13.34	10.45	4	0.66	54.75	15.44	7.11
62	56.4	1	0.06	39.00		−6.45	5	0.83	61.60	9.61	7.01
63	57.0	1	0.06	54.00		19.70	4	0.66	58.00	12.83	6.91
64	57.5	1	0.06	82.00		26.94	4	0.66	61.75	9.14	10.51
66	58.7	3	0.17	56.33	6.03	15.43	5	0.83	61.20	8.53	8.82
67	59.3	2	0.12	63.50	6.36	3.41	7	1.16	61.43	10.88	6.98
68	59.9	1	0.06	57.00		6.13	4	0.66	60.75	7.68	6.29
70	61.0	4	0.23	78.00	16.87	25.03					
72	62.3						5	0.83	76.80	14.02	21.06
73	62.9						2	0.33	64.50	14.85	12.12
74	63.5	1	0.06	69.00		30.61	1	0.17	60.00		7.37
75	64.2						2	0.33	66.00	12.73	17.09
76	64.9	1	0.06	58.00		1.54	2	0.33	82.00	24.04	26.60
77	65.6	2	0.12	67.50	14.85	11.49	1	0.17	81.00		28.14
78	66.3	1	0.06	69.00		22.47	2	0.33	72.50	19.09	14.73
79	67.0	1	0.06	68.00		7.17	2	0.33	78.50	28.99	21.40
81	68.5						3	0.50	74.33	13.87	19.67
82	69.3						1	0.17	78.00		19.42
83	70.1						2	0.33	87.00	16.97	30.67
85	71.8						1	0.17	59.00		0.10
87	73.7	1	0.06	82.00		31.93	2	0.33	83.50	3.54	35.01
89	75.8						1	0.17	82.00		24.83
90	77.0	1	0.06	74.00		14.99					
95	84.6						1	0.17	99.00		39.86
99	99.0						1	0.17	99.00		52.13

FIGURE 6.14 MEAN RESIDUAL READING ACHIEVEMENT SCORES NOT ADJUSTED FOR SIF GRADES 1-3

GRADE 1 READING



GRADE 2 READING



GRADE 3 READING

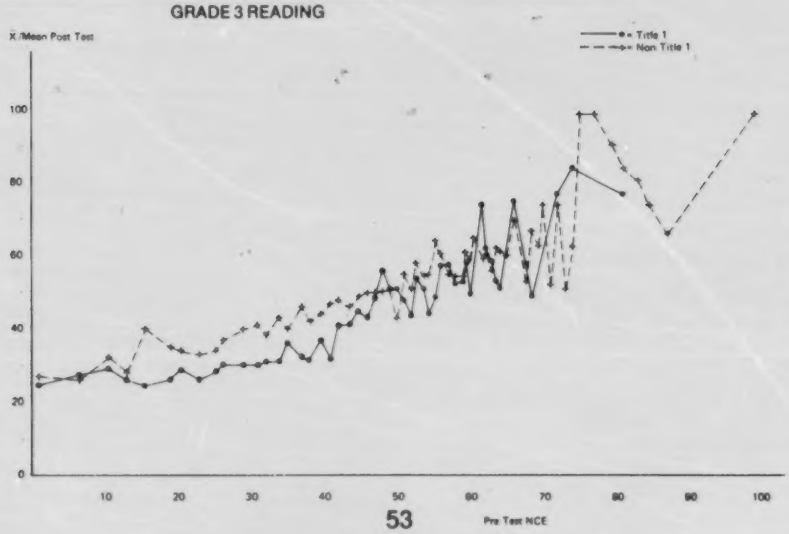
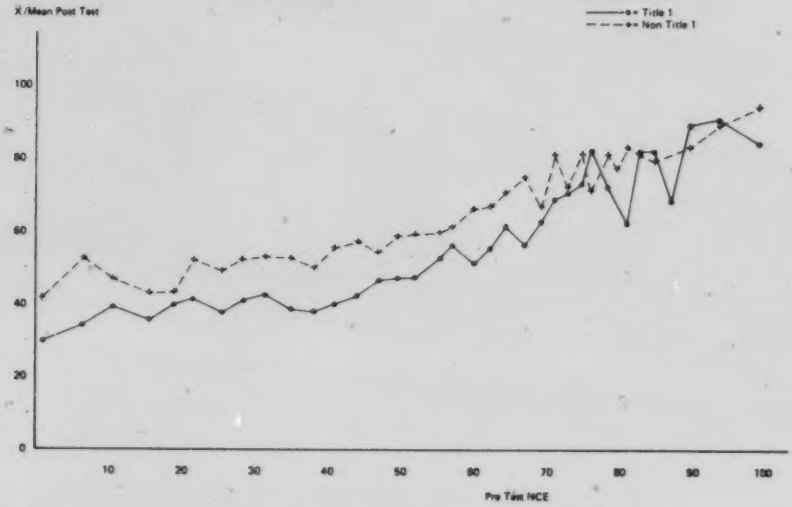
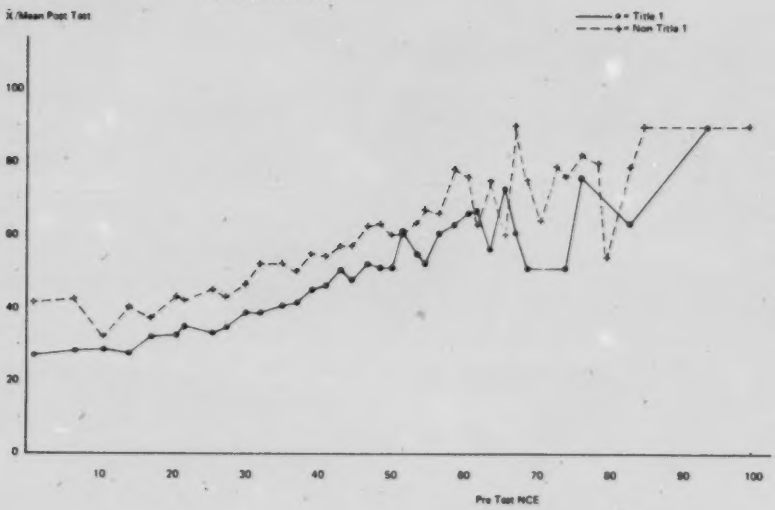


FIGURE 6.15 MEAN RESIDUAL MATHEMATICS ACHIEVEMENT SCORES NOT ADJUSTED FOR SIF GRADES 1-3

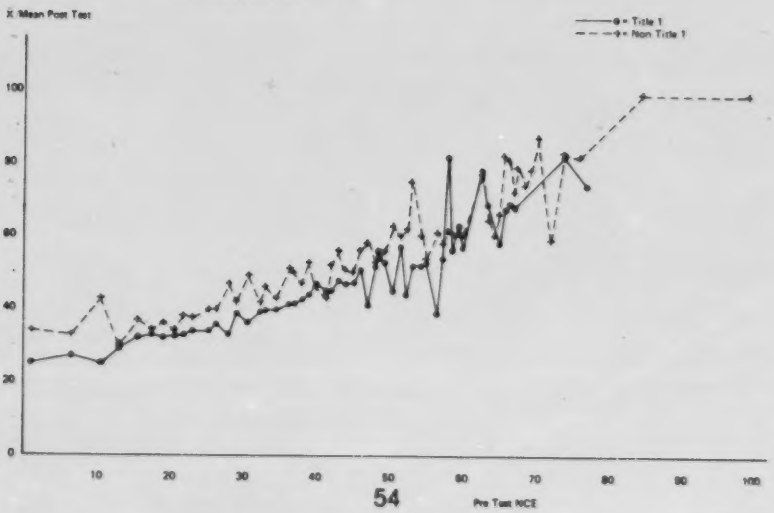
GRADE 1 MATH



GRADE 2 MATH



GRADE 3 MATH



FOOTNOTES

[6.1]The norm-referenced model is referred to as Model A in the technical literature about evaluation of Title I Programs.

[6.2]An appendix to this report has been provided to discuss NCE scores and how they are derived from percentiles. All of the data in this chapter are presented as NCE scores.

[6.3]G. K. Tallmadge, "The Joint Dissemination Review Panel IDEABOOK," Department of Health, Education, and Welfare, USOE (1977).

[6.4]A. J. Stenner, M. L. Cooper, J. D. Bland, and E. L. Hunter, "The Standardized Growth Expectation: Implications for Educational Evaluation," A paper presented at the spring 1978 AERA meeting, in Toronto, Canada.

CHAPTER VII
SELF-CONCEPT

The Self Observation Scales (SOS) used in the present evaluation is a direct, self-report, group administered, nationally normed, and standardized instrument with empirically determined scales which measure the ways in which children perceive themselves and their relationships to peers, teachers, and school (Stenner and Katzenmeyer, 1973). Briefly, the SOS has been developed to measure factor analytically derived dimensions of children's affective behavior. Four such dimensions (Self-Acceptance, Social Maturity, School Affiliation, and Self-Security) at a primary level and eight dimensions (Self-Acceptance, Self-Security, Social Confidence, Self-Assertion, Family Affiliation, Peer Affiliation, Teacher Affiliation, and School Affiliation) at the junior high level have been shown to be useful in predicting important aspects of children's development. Some of these scales mark well known dimensions of children's behavior. For example, Self-Security is actually the inverse of trait anxiety and has been the focus of research for a number of years. School Affiliation, Teacher Affiliation, and Peer Affiliation represent constructs which educators have long used in describing children. Social Maturity and Social Confidence are somewhat innovative notions and have not received much attention in self-concept research.

The primary level (Form C) of the SOS) is designed for use at grades K-3. Each of the four scales at this level is labeled in a positive manner, with high scores being most characteristic of the label. Below are descriptions of each scale.

Scale I. Self-Acceptance

Children with high scores view themselves positively and attribute to themselves the qualities of happiness, importance, and general competence. These children see themselves as important to other people, including authority figures and their peers. Children with low scores view themselves as inadequate, unsuccessful, and undesirable. They do not see themselves as happy, and they view themselves as relatively unimportant to authority figures and their peers. Three items which reflect the values of this scale are:

- Do the other children in the class think you are a good worker?
- Are you good-looking?
- Do you feel good about yourself most of the time?

Scale II. Social Maturity

Children with high scores view their relationships and interactions with other people (especially peers) positively. They view themselves as independent, persistent, and sensitive to the needs and feelings of others. Children with low scores view themselves as quitters and loners. They see themselves as wanting to dominate in peer situations; however, they actually would prefer to be alone. Low scores reflect an uncertainty in social interactions. Three items highly descriptive of this scale are:

- Do you like to play only when you are the leader?
- Do you always want to be first in line?
- Do other children do things better than you?

Scale III. School Affiliation

Children with high scores view school as a positive influence in their lives. They enjoy going to school and enjoy the activities associated with school. Children with low scores view school as an unhappy place to be. They do not enjoy most school-related activities and are negative about the importance of school in their lives. Three items highly descriptive of this scale are:

- Do you like to come to school every day?
- Is School a happy place?
- Do you like to stay home from school?

Scale IV. Self-Security

Children with high scores report a low level of anxiety and a high level of emotional stability. These children view themselves as being in harmony with people around them, and they are confident about new experiences and their ability to perform adequately. Low scoring children report being anxious, depressed, and unsure of themselves. New experiences tend to be anxiety provoking, stemming from the children's uncertainty about their ability to perform. Three items highly descriptive of this scale are:

- Do you get nervous at school?
- Do you feel lonely very often?
- Do you worry about a lot of things?

SELF-CONCEPT AND ACHIEVEMENT

The relationship between self-concept and achievement is graphically presented in figures 7.1 to 7.4. Each figure presents the average scores of an SOS scale, and the average scores are broken out first by grade, and then separately for the reading quartile and the math quartile from the student's nationally normed achievement tests. The differences between the grade-by-grade breakout for the reading and math quartiles are insignificant in comparison to their agreement, so that the overall pattern will be considered as a whole. The main similarity between the achievement breakouts and the Title I program participation breakout is that the trends in the different SOS scales are generally the same. Self-Acceptance declines from grade 1 to grade 3 at each quartile, Social Maturity rises from grade 1 to grade 3 at each quartile, and School Affiliation is fairly stable across grades for all quartiles, just as for the Title I/non-Title I patterns previously discussed. On the other hand, when Self-Security is examined across grades, and quartile by quartile, instead of by Title I versus non-Title I, a developmental trend appears. Especially from grade 1 to grade 2, students at the same achievement quartile appear to gain in Self-Security. This may be due primarily to a decline in anxiety as students adjust to the school process and environment. On the other hand, this decline in anxiety may be associated with a decline in what the student's perceive to be the demands for expected successful performance that the educational or social processes place upon them. In any event, without additional data, only speculation is possible. When the previous breakout by Title I program participation is examined, this development in Self-Security from grade 1 to grade 2 is seen particularly for Title I students. The main difference between the breakout of the self-concept scales by achievement and by Title I program participation is that the breakout by achievement provides a much greater differentiation of self-concept than Title I program participation. In fact, in the previous discussion it was pointed out that Title I program participation is not significant when other domains are included in the analysis. One of the reasons that Title I program participation even appears to be significant when the other domains are not present is that it is associated with differences in achievement and other student characteristics. In contrast to the spurious significance of Title I program participation, the level of achievement test scores is consistently in association with self-concept. Self-concept and achievement tend to be relatively high or low together, for all self-concept scales, and at all grades.

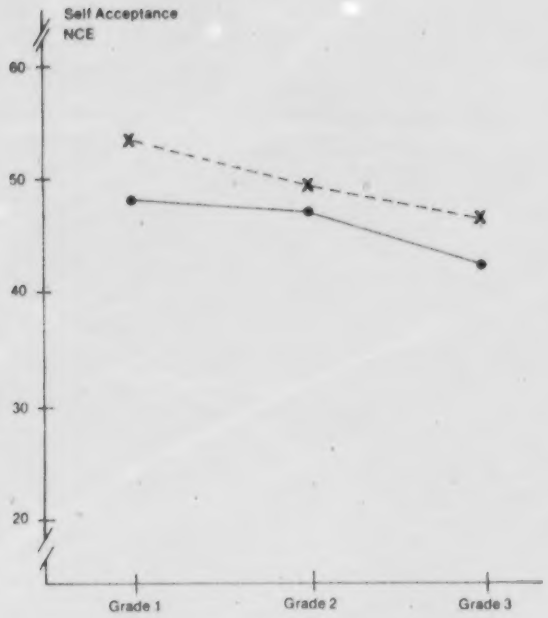
SELF-CONCEPT AND THE TITLE I PROGRAM

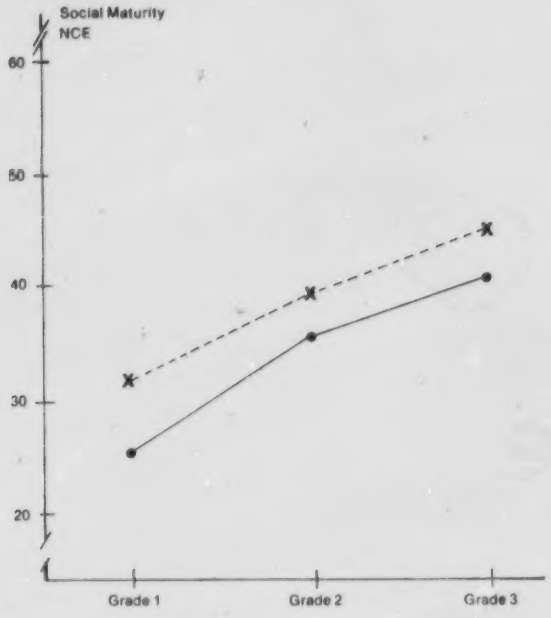
The self-concept factor scores of Title I and non-Title I students are presented in table 7.1 for each grade separately, and figure 7.6 presents the same data as graphs. This data is presented with a very strong reservation. The results of the previous section indicate that the effect of Title I program participation is not significant for differentiation of self-concept when it is considered as just one factor within the larger pool of variables that were considered in the commonality analysis and the analysis of variance. The presentation of the self-concept factor scores broken out by just grade and Title I program participation is misleading, because in the absence of the other variables previously considered, and when a T-Test is used at each grade reportedly, Title I program participation is generally indicated as being a significant factor in the differentiation of self-concept factor scores at each separate grade. This apparent significance of Title I program participation is due entirely to the absence of the variables that are really significant. The differences betweeen the self-concept scores of Title I and non-Title I students are not due to the effect of the Title I program upon their self-concepts, but rather due to the different characteristics of the students that are associated with program partici-

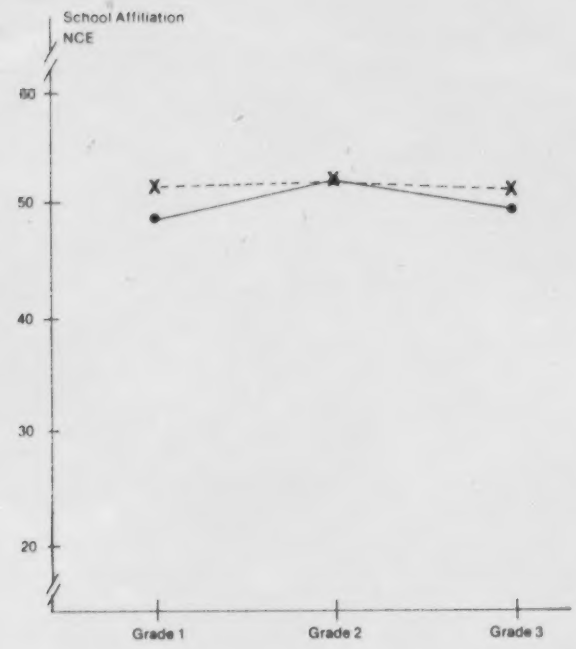
TABLE 7.1 SOS FACTOR SCORES FOR TITLE I AND NON-TITLE I STUDENTS, BY GRADE

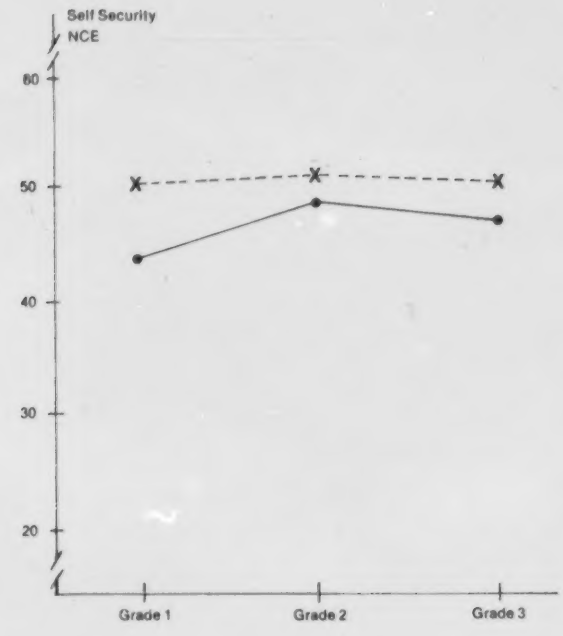
		Grade 1				Grade 2				Grade 3			
		Self Acceptance	Social Maturity	School Affiliation	Self Security	Self Acceptance	Social Maturity	School Affiliation	Self Security	Self Acceptance	Social Maturity	School Affiliation	Self Security
Title I	Mean	48.16	25.35	48.73	43.93	47.26	35.59	52.23	48.37	42.05	40.74	49.72	46.93
	SD	16.57	17.56	18.43	19.02	17.66	18.82	19.37	17.35	19.32	18.75	21.04	17.79
	N	1807	1807	1807	1807	1562	1562	1562	1562	1491	1491	1491	1491
Non-Title I	Mean	53.98	31.71	51.75	50.63	49.92	39.34	52.09	51.14	46.29	45.13	51.10	50.60
	SD	15.96	18.45	18.72	18.66	17.61	18.89	19.74	17.67	18.58	17.53	20.15	17.86
	N	753	753	753	753	652	652	652	652	568	568	568	568
	T	-8.18	-8.23	-3.76	-8.16	-3.24	-4.28	0.16	-3.40	-4.49	-4.83	-1.35	-4.18
	Prob►|T|	0.0001	0.0001	0.0002	0.0001	0.0012	0.0001	0.8735	0.0007	0.0001	0.0001	0.1773	0.0001

FIGURE 7.6 SOS SCALES GRAPHED ACROSS GRADES FOR TITLE I AND NON-TITLE STUDENTS









pation, and possibly to differences in the schools which have more or less numbers or percentages of Title I students. The data is presented with this reservation solely because the Title I program is the focus of this evaluation.

An interesting fact that is apparent in the data, is that School Affiliation is the self-concept scale that is least different between Title I and non-Title I students. In fact, except at the first grade, there is not a significant difference between the School Affiliation of Title I and non-Title I students. On the other hand, at each of grades 1-3, the differences in self-concept between Title I and non-Title I students are significant for all of the other scales, in the absence of the other variables that had been used in the previously discussed analysis. For Self-Acceptance, there is a general decline in the average scores of both Title I and non-Title I students, from grade 1 to grade 3. It is possible that this decline is associated with the general year-to-year decline in achievement scores that is discussed in chapter 6. The year-to-year development in Self-Acceptance certainly parallels the year-to-year trend in achievement scores. It is also possible that the overall decline in Self-Acceptance could be a reaction to general social processes that have nothing to do specifically with the educational process. without further data, any comments about the decline in Self-Acceptance are merely speculative. In contrast to Self-Acceptance, there is a remarkable growth in Social Maturity for both Title I and non-Title I students between grade 1 and grade 3. This development can be interpreted as reflecting an accelerating process of maturation in this area, when the DC students are compared to the development of the norming group. In other words, both the Title I and non-Title I students are developing their Social Maturity faster than the norming groups. Overall, the self-concept profiles of both the Title I and non-Title I students are reasonably close to the national average, and the mean SOS factor scores are within half of a standard deviation of the national norm, except for Social Maturity at the early grades.

FACTORS AFFECTING SELF-CONCEPT

There are many factors that effect the development and state of a child's self-concept. The factors that will be included in the analysis are:

- the child's individual characteristics, as reflected in the teacher reported Student Information Form (SIF).
- the student's grade (GRADE).
- the student's achievement test scores on the nationally normed CTBS achievement test (ACH).
- A Title I program participation indicant (TITLE).
- the school which the student attends (SCHOOL).

Before analyzing in detail the impact of separate variables upon self-concept, global analyses of the simultaneous association of all of the factors with each of the self-concept scales will be presented in order to determine the relative significance of each of the factors in association with each of the self-concept scales. Both an analysis of variance that includes variables representing each of the factors, and a commonality analysis upon a more detailed variable pool representing each of the factors will be presented.

Table 7.2 presents the results of four analyses of variance, one analysis of variance for each of the SOS scales. The independent variables used in each of the analyses of variance are:

- School ID number (SCHOOL)
- Student Grade
- A Title I program participant indicant (TITLE).
- Student sex, as one of the most pervasive and universally applicable individual characteristic.
- The reading and mathematics achievement test score quartiles.

Table 7.3 presents the results of a commonality analysis for each of the SOS scales. The independent variables used in each of the commonality analyses include School, Grade, and Title as above, and instead of sex and the reading and math quartiles, more detailed representations of individual characteristics and of achievement scores are used in the independent variable pool. The raw variable sets are:

- A complete set of variables derive from the Student Information Form that represent all of the behavioral and background characteristics reported on the SIF. This group of variables is identical to the one used in the commonality analyses of the achievement test scores in Chapter VI.
- A detailed representation of the achievement scores on the reading total and mathematics total subscales that includes:
  - Posttest reading and math scores.
  - reading and math gain scores.
  - the square of the posttest reading and math scores.
  - the product term for the reading and math posttest scores with grade.

The primary statistics of interest from the analyses of variance are the F statistics representing the relative significance of each of the factors in association with each of the SOS scales. The statistics from the commonality analyses that are of primary interest are the percentages of the variance in the SOS scale scores that are uniquely associated with each separate factor or domain by itself. There are occasions when the Analysis of Variance and the Commonality Analysis will indicate that the order of relative significance of the variables and domains is different. There are two reasons for this. In the case where the same variable is used in both analysis, (School, Grade, and Title), the F ratio from the analysis of variance is significant relative to the variable's degrees of freedom, and the three common variables have different degrees of freedom, while the relative percentage of variance explored by the variables in the commonality analysis is closer to the relative size of the product of the F statistic and the degrees of freedom, than to just the F statistic. In the case where different variables are used there will obviously be possibilities for changes in the relative importance of the domains between the two analyses. In most cases the commonality analysis results are better estimates of the relative association of the domains with the SOS scores, and will be used as the basis for discussion. Students from grades 1-3, both Title I and non-Title I, and both male and female are included in all of the analyses.

For Self-Acceptance, the commonality analysis indicates that in terms of differentiating the Self-Acceptance scores, or in terms of the percentages of variation in Self Acceptance scores that are uniquely associated with the domains, the order of importance of the domains being discussed is: first, the individual's characteristics as reported on the SIF; second, the school which the student attends; third, the student's achievement test score results; and fourth, the student's grade in school. Title I program participation is not uniquely and independently associated with any differentiation of the students Self-Acceptance. The analysis of variance indicates that neither Title I program participation nor sex is significant in association with Self-Acceptance, while the other variables are all significant at the 0.0001 level. It must be remembered that the relative significance of a variable or domain in an analysis of variance or a commonality analysis is dependent upon the total pool of variables that is used in the analysis. It is entirely possible that if some or all of the other variables were not included in an analysis, then either Title I program participation or sex could be indicated as being significant factors due to the absence of the other variables included in the total pool. In fact, when the relationships between Title I program participation and the SOS scores are examined in more detail, it will turn out that when a T-test is used at each grade separately, the differences between the SOS scores of Title I and non-Title I students are generally indicated as being significant. In the more broadly based analysis that is presented here, other factors are seen to be more fundamentally important, and when differences in the school attended, grade, achievement scores, and individual characteristics are included in the analysis, the differences between the Title I and non-Title I students' Self-Acceptance scores that are independent from these other factors are seen to be non-significant, and the significant differences can be explained in terms of the other variables included in the analysis.

It should not be surprising that the commonality analysis of the self-acceptance scores indicates that the individual student characteristics are the most important influence in the differentiation of

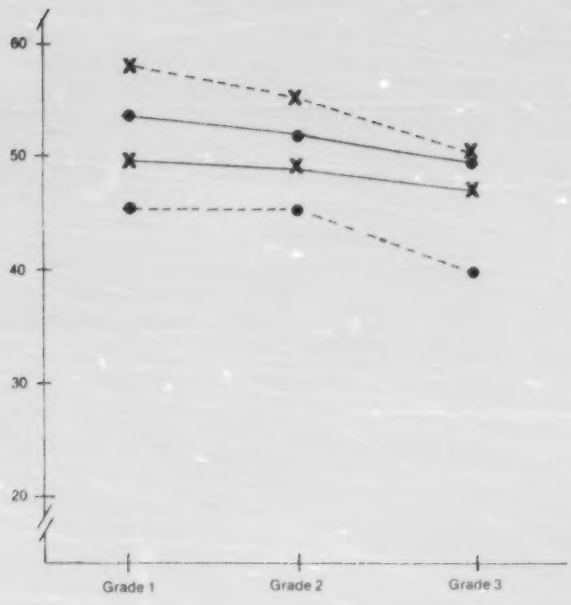
the students' self-acceptance. What is perhaps surprising, is that the school which the student attends is the next most important factor, and is even more important than the student's achievement results and grade in school. Because there are no data on the different schools that is available for use in these analyses, the particular aspects of the different schools which are significant in association with the students' self-acceptance can not be identified. It is possible that a cohort or neighborhood effect is involved, or that there are unidentified aspects of the schools or school personnel that impact upon the student's self-concept. As a domain in the analysis, the (student's) achievement test results are uniquely associated with almost as much of the variance in self-acceptance as the school factor. Apparently, the students take their school performance seriously, and how they perform in school is generally important for how the students feel about themselves. The student's grade level in school is associated with less than half as much of the variation in self-acceptance as either the school that is attended or the students' achievement scores, although it is still a significant factor in the analysis.

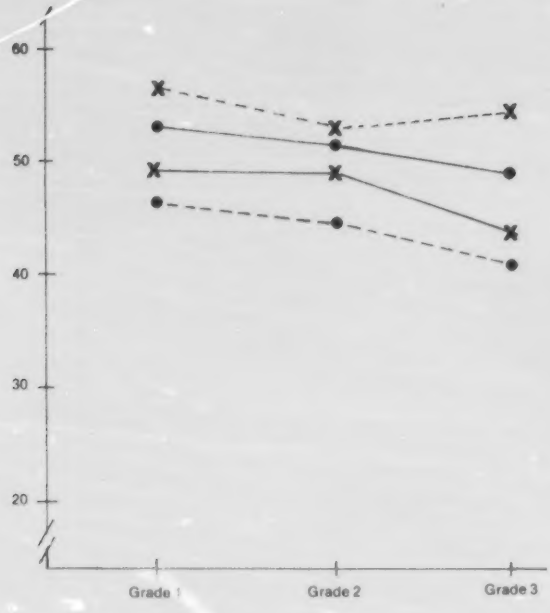
For Social Maturity, the commonality analysis indicates that in terms of unique association with the variance of the Social Maturity scores, the general level of association of the significant factors is about even, and the overall order of importance of the domains being discussed is: first, the school which the student attends; second, the student's achievement test scores; third, the student's individual characteristics as reported on the SIF; and fourth, the student's grade in school. Once again, Title I program participation is not uniquely associated with any measurable percentage of the variance of Social Maturity scores. Because Social Maturity is closely related to the total development of the child in society, it is very surprising that the student's grade is the least important significant factor among the pool of variables being observed. This situation is very suggestive that there is a good deal of developmental differentiation within the grades, so that a student's grade is perhaps not a highly reliable indication of his level of social maturity. Another factor that should be considered is suggested by the analysis of the Piagetian data in Chapter 8. The Piagetian data reveals an association between relatively good levels of cognitive development and relatively good achievement scores. If the grades are not developmentally homogeneous, the relative achievement test score could be as good or better an indication of the general level of the child's total development than merely the child's grade. In fact, the achievement scores are even more important in association with the variation of Social Maturity scores than the individual characteristics of the student as reported on the SIF. Since school is the most important factor, it is possible that there is a cohort or neighborhood/peer group factor that needs to be considered.

For School Affiliation, the commonality analysis indicates that the overall order of relative importance of the domains included in the analysis is: first, the school which the student attends; second, the student characteristics as reported on the SIF; third, the achievement test scores; and fourth, the student's grade. It is interesting to note that while the student's achievement scores were more important than individual characteristics from the SIF in association with Social Maturity, the order of importance for School Affiliation is reversed. In fact, in the analysis of variance where just the reading and mathematics quartiles are used, the reading quartile is not significant at all while the math quartile is. In the analysis of variance, grade is significant only at the .02 level, with three degrees of freedom, while Title I program participation is not significant. In the commonality analysis, grade is uniquely associated with less than twice the percentage of variation that Title I program participation is associated with. The variation in School Affiliation associated primarily with the student's school, individual characteristics, and achievement scores, and the student's grade and Title I program participation are associated with relatively little of the variation in School Affiliation.

For Self-Security, the commonality analysis indicates that in terms of differentiating the Self-Security scores, the order of relative importance of the domains included in the analysis is: first, the student characteristics as reported on the SIF; second, the achievement test scores; third, the school which the student attends; and fourth, the student's grade in school Title I programs is not significant as a factor in association with Self-Security, and it is uniquely associated with less than 1% of the "Explained" variation in Self-Security. Self-Security can be thought of as the reverse of an anxiety index, and individual characteristics account for more of the variance of the Self-Security scores than any of the other domains included in the analysis. Self-Security is the only scale for which the school which a student attends is not the first or second most important factor, and instead the student's

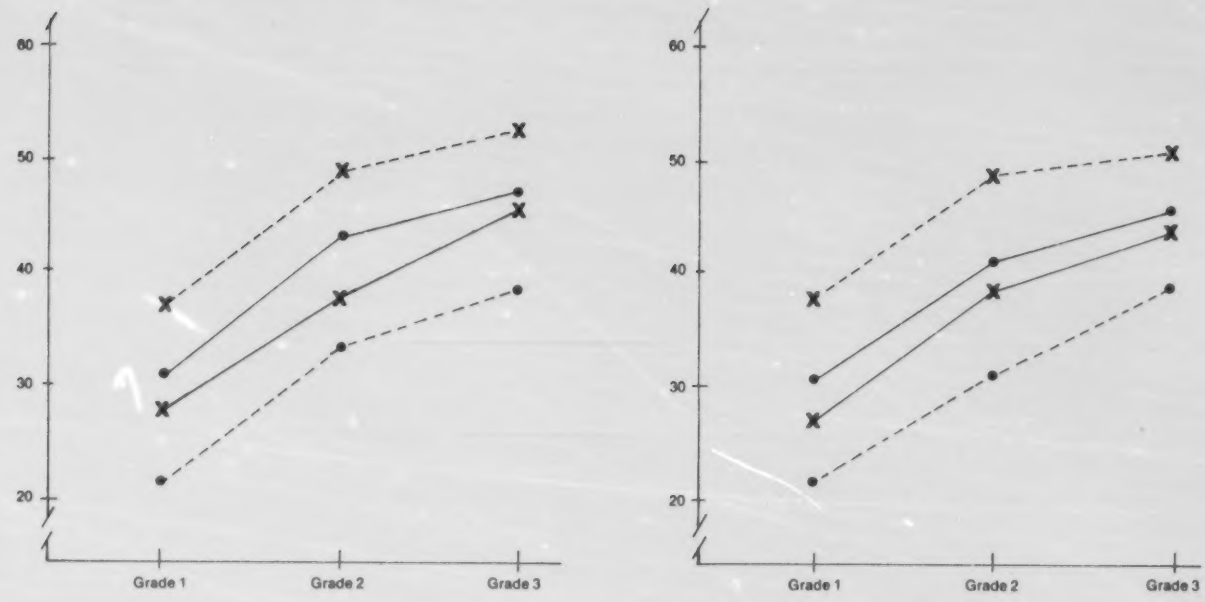
FIGURE 7.1 SELF ACCEPTANCE BREAKOUT AND GRAPHS BY GRADE AND ACHIEVEMENT QUARTILE





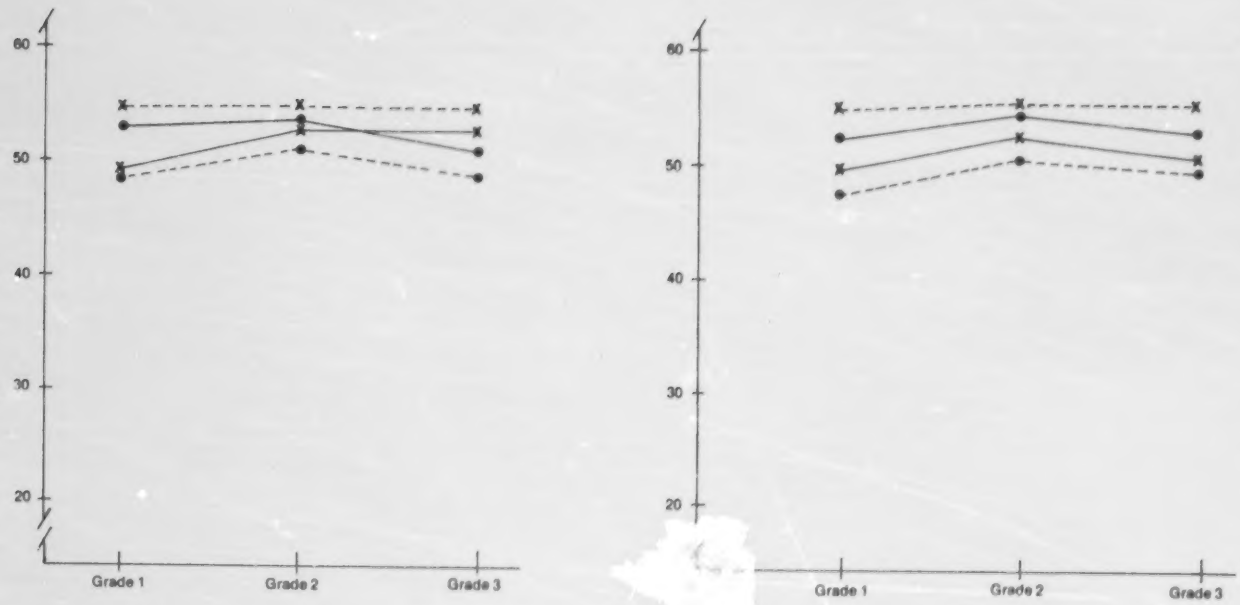
		FIRST RQ	SECOND RQ	THIRD RQ	FOURTH RQ	FIRST MQ	SECOND MQ	THIRD MQ	FOURTH MQ
Grade 1	Mean	45.628	49.303	53.785	58.374	46.294	49.698	53.679	56.306
	SD	16.454	17.170	16.535	13.899	16.942	15.849	15.420	16.710
	N	463	572	598	268	523	444	512	398
Grade 2	Mean	45.328	48.808	52.081	55.173	44.570	49.119	51.514	53.185
	SD	17.[illegible]	16.580	17.514	16.276	17.767	16.623	17.420	16.805
	N	[illegible]20	647	325	154	708	546	390	238
Grade 3	Mean	39.808	46.802	49.438	50.709	40.670	43.719	48.946	54.285
	SD	19.371	17.776	17.842	17.185	19.499	18.593	17.020	16.128
	N	950	551	283	76	701	656	337	118

FIGURE 7.2 SOCIAL MATURITY BREAKOUT AND GRAPHS BY GRADE AND ACHIEVEMENT QUARTILE



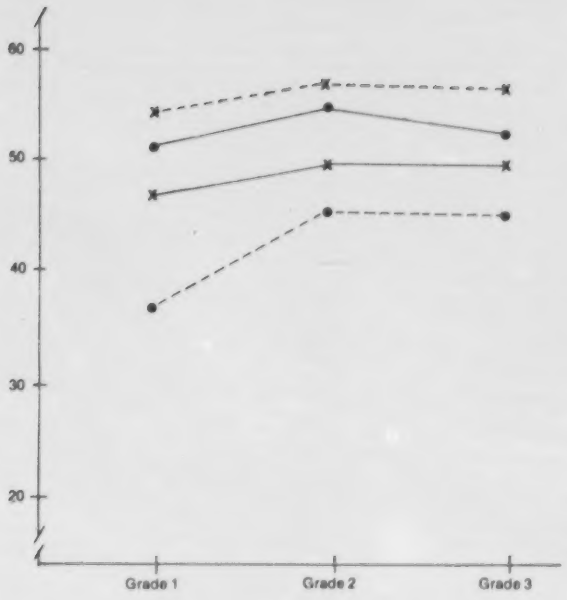
		FIRST RQ	SECOND RQ	THIRD RQ	FOURTH RQ	FIRST MQ	SECOND MQ	THIRD MQ	FOURTH MQ
Grade 1	Mean	20.875	27.116	32.117	36.001	21.494	26.369	30.511	37.797
	SD	17.069	17.646	17.744	18.216	16.745	17.704	17.755	17.418
	N	463	572	598	268	523	444	512	398
Grade 2	Mean	32.998	37.426	42.894	48.500	30.852	38.255	40.836	48.512
	SD	18.624	18.296	17.509	16.841	18.305	18.463	17.186	16.579
	N	720	647	325	154	706	546	390	238
Grade 3	Mean	38.282	45.319	46.753	52.258	38.410	43.810	45.173	50.294
	SD	18.814	17.746	16.766	13.831	18.493	18.534	17.226	15.547
	N	950	551	783	76	701	656	337	118

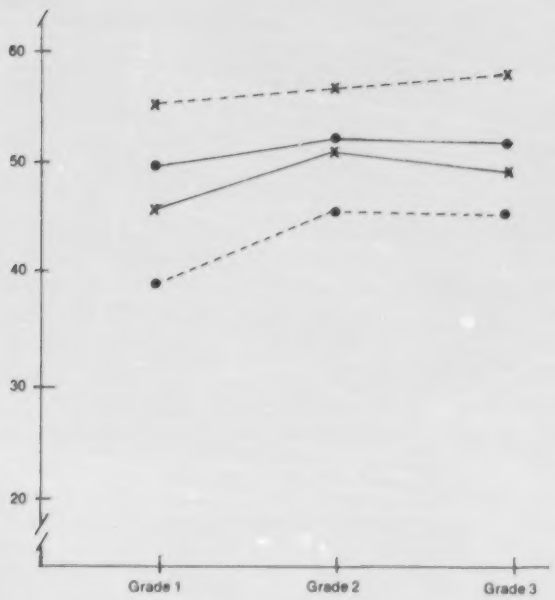
FIGURE 7.3 SCHOOL AFFILIATION BREAKOUT AND GRAPHS BY GRADE AND ACHIEVEMENT QUARTILE



		FIRST RIQ	SECOND RIQ	THIRD RIQ	FOURTH RIQ	FIRST MIQ	SECOND MIQ	THIRD MIQ	FOURTH MIQ
Grade 1	Mean	48.209	48.974	52.749	54.225	47.586	49.356	52.105	54.584
	SD	18.055	19.195	18.985	17.312	18.430	18.518	19.004	18.713
	N	463	572	598	268	523	444	512	398
Grade 2	Mean	51.029	52.663	53.424	54.625	50.146	52.372	54.140	55.540
	SD	19.545	19.639	19.860	20.626	19.869	19.688	19.250	18.813
	N	720	647	325	154	706	546	390	238
Grade 3	Mean	48.655	52.489	50.841	54.154	49.104	50.312	52.744	55.825
	SD	21.006	19.756	20.181	18.078	20.788	21.050	18.763	17.610
	N	950	551	783	76	701	656	337	118

FIGURE 7.4 SELF SECURITY BREAKOUT BY GRADE AND ACHIEVEMENT QUARTILE, WITH GRAPHS





		FIRST RQ	SECOND RQ	THIRD RQ	FOURTH RQ	FIRST MQ	SECOND MQ	THIRD MQ	FOURTH MQ
Grade 1	Mean	37.364	46.823	51.136	54.059	38.938	45.992	49.680	54.999
	SD	19.856	17.782	16.942	19.073	19.638	17.681	18.328	16.759
	N	483	572	598	268	523	444	512	398
Grade 2	Mean	45.989	49.946	54.548	56.773	45.669	50.509	51.949	56.114
	SD	17.472	16.366	15.587	16.826	16.976	16.399	16.345	16.347
	N	720	647	325	154	708	546	390	238
Grade 3	Mean	45.106	49.883	52.331	56.440	44.757	48.701	51.478	57.567
	SD	17.514	17.458	18.064	15.429	17.300	17.642	17.933	15.784
	N	950	551	783	76	701	656	337	118

TABLE 7.2 SOS ANALYSIS OF VARIANCE WITH SCHOOL, GRADE, TITLE, SEX AND READING AND MATH QUARTILE

		Model Total	School	Grade	Title 1 Indicant	Sex	Reading Quartile	Math Quartile
Self Acceptance	F	8.64	2.26	19.34	3.04	2.78	13.33	7.43
	DF	52	41	3	1	1	3	3
	Pr►F	0.0001	0.0001	0.0001	0.0811	0.0958	0.0001	0.0001
		$R^2 = 0.100658$		$R = 0.3173$	$X = 48.0703$			
Social Maturity	F	18.11	3.91	182.22	0.35	7.39	17.66	24.87
	DF	52	41	3	1	1	3	3
	Pr►F	0.0001	0.0001	0.000	0.5561	0.0066	0.0001	0.0001
		$R^2 = 0.189463$		$R = 0.4358$	$X = 36.3885$			
School Affiliation	F	4.42	3.52	3.24	0.40	23.97	1.19	5.66
	DF	52	41	3	1	1	3	3
	Pr►F	0.001	0.0001	0.0210	0.5297	0.0001	0.3102	0.0008
		$R^2 = 0.054166$		$R = 0.2327$	$X = 51.4838$			
Self Security	F	8.04	1.96	18.83	3.25	7.50	17.51	19.74
	DR	52	41	3	1	1	3	3
	Pr►F	6.0001	0.0003	0.0001	0.0714	0.0062	0.0001	0.0001
		$R^2 = 0.094324$		$R = 0.3079$	$X = 48.4520$			

N = 4069

TABLE 7.3 ABSOLUTE AND RELATIVE PERCENTAGES OF VARIANCE IN SOS SCALES UNIQUELY ASSOCIATED WITH VARIOUS DOMAINS*

	Self Acceptance		Social Maturity		School Affiliation		Self Security	
	Absolute	Relative	Absolute	Relative	Absolute	Relative	Absolute	Relative
School	1.78%	13.27%	2.79%	12.41%	3.18%	37.97%	1.52%	11.42%
Grade	0.74%	5.50%	2.01%	8.97%	0.33%	3.91%	1.04%	7.81%
Title I Indicant	0.0	-	0.0	-	0.22%	2.65%	0.11%	0.85%
Sif Variables	3.01%	22.41%	2.19%	9.76%	3.09%	36.88%	3.36%	25.0%
Achievement	1.70%	12.64%	2.64%	11.76%	1.44%	17.15%	2.47%	18.52%
Total with Common	13.42%		22.45%		8.37%		13.34%	
Multiple R	.3663		.4738		.2893		.3652	

*Note: the absolute percentage is 100 R^2.

These figures were derived from a file with a total of 6,384 cases. Each of the estimates was based upon a regression analysis, and the number of cases in the regression analysis varies between 4,254 and 6,384 depending on the percent of missing values.

achievement is the second most important factor after the SIF characteristics. Apparently in the context of this analysis, Self-Security is more particularly a reflection of the individual and is less sensitive to social and environmental effects than the other SOS scales. Grade is still significant, and makes a reasonable contribution to the variance associated with the total pool of variables.

When all four SOS scales are taken together, and in terms of the relative rank of the percentages of variation in the SOS scales that are uniquely associated with each of the scales in turn, the individual characteristics of the students as reported on the SIF, and the school which the student attends, are the most important, and are both about equally important, in differentiating the self-concept of the students in general, and as a whole. The student's achievement test scores are almost as important, but definitely not as important for self-concept, as either the personal characteristics of the student, or the school which the student attends. In association with self-concept, the student's grade is always significant as a factor, but it is always the least important of the significant factors. Within the context of the other variables used in this analysis, Title I program participation is not a significant factor in the differentiation of the students' self-concept.

Social Maturity is the self-concept scale that is most highly associated with the variable pool in the analysis, and School Affiliation is the least, while Self-Acceptance and Self-Security are intermediate and almost equal in their association with the total group of variables. The percentages of total variations in the Self-Concept scores that are associated with the data that are available for analysis are considerably less than what is attained in similar analysis for the achievement test scores. Of course, in the context of the educational process, the achievement scores are of more immediate interest and importance, and the data that has been gathered were intended primarily for their utility in association with academic development. It is of considerable interest, however, that even though there is a significant association between self-concept and achievement, the relative magnitude of their association clearly indicates that as self-concept and achievement are currently measured, they are more independent from each other than they are in association with each other.

CHAPTER VIII
PIAGETIAN CONSERVATION ASSESSMENT

The mental development of the child proceeds through four main periods, with each period corresponding to a general age range. The four periods and their general age ranges are:

- Sensorimotor, 0-2 years.
- Preoperational, 2-7 years.
- Concrete operations, 7-11 years.
- Formal operations, 11 years and onwards.

Each of these periods or stages is characterized by its own types of cognitive structures or processes through which the child's main behavior patterns can be explained. During the sensorimotor period, the child evolves from a stage in which he is capable of merely reflexive reaction to a point at which he is ready to internally symbolize problems and situations. In the period of preoperational thought, the child develops the symbolic function and the use of language. In the period of concrete operations, the child develops a coherent use of symbolism in relation to, and as a part of, his experiencing of reality. In the period of formal operations, symbolic operations themselves become the possible subject for abstract operation by the child. Table 8.1 gives typical abilities for each of the four stages. The development of the child from one period to the next involves a reintegration of the cognitive processes of the earlier period into a new structure and level of cognitive organization and function that is typical of the new, emerging period. The order of progression through the stages is constant, although the age periods at which the stages occur may vary with the individual.

There are four main factors which affect the process of development through the invariant sequence of cognitive periods. The first factor affecting cognitive development is organic growth, especially the maturation of the nervous and endocrine systems. For example, the child's development of the coordination of vision and prehension at about four or five months of age depends upon organic growth. Organic growth or maturation does not generally ensure the appearance of a new behavior pattern or cognitive structure; it only provides new opportunities for development. Maturation must be supplemented with at least a minimum of experience and functional exercise.

The second factor is experience and functional exercise and is of two types: (1) physical experience and (2) logical-cognitive experience. In physical experience properties of objects are abstracted by acting upon objects. This does not merely mean perceiving a situation and remembering the experience, but instead involves an active assimilation of new experiences to the cognitive structures, categories, and processes previously developed. This active assimilation, in turn, brings a further development of the cognitive structures as they are accommodated to new experience. In logical-cognitive experience, development originates in a similar process focused upon actions rather than objects.

The third factor affecting cognitive development is social interaction and transmission. The processes of socialization and education require the active participation of the developing child, as does any aspect of his developmental experience. Social action directed at developing the child is ineffective without his active assimilation of the experience. This presumes that the child is appropriately developed, with operatory structures and processes adequate to assimilate the directed social action.

The fourth factor is the process of interval equilibrium and self-regulation. In the process of assimilating new experience to previously developed cognitive structures, the child's mind accommodates to and assimilates the new stimulus. The process of accommodation to the new aspects of the child's experience introduces a disturbance into his cognitive processes, which elicits an active compensation in order to establish a new integration in equilibrium.

Cognitive development is important not only for its own sake, but also because of its interrelations with affective development and motivation. It is true that behavior is energized by affective processes, but the structure of behavior in itself has a highly significant cognitive dimension. All affective states and processes involve perceptions or comprehensions which have their bases in cognitive structures and processes. The affective and cognitive dimensions of behavior and experience are inseparable. Both are necessary, and neither can be reduced to the other.

TABLE 8.1. PIAGET'S STAGES OF COGNITIVE DEVELOPMENT*

CHARACTERISTIC ACTIVITIES
Sensorimotor
• Intelligence is manifested in overt behavior.
• Innate reflexes become more efficient.
• Simple acts are repeated for their own sake.
• Simple acts are repeated to produce interesting effects.
• Learned responses are used to obtain a desired goal.
• Active trial-and-error experimentation is initiated.
• New means are invented through internal mental combinations.
Preoperational
• Use of language is frequent.
• Meanings of objects and events are manipulated and the child engages in symbolic behavior.
• Viewpoint of another person is difficult to comprehend.
• Words and images are not generally organized into solidly understood rules and concepts.
Concrete Operations
• Series of actions can be represented mentally.
• The ability to conserve develops and improves.
• Relational terms are understandable.
• The notions of a whole and its parts are comprehended.
• Objects can be arranged along some quantified dimension on an ordinal scale, such as length or weight.
Formal Operations
• A number of possible explanations of, or solutions to, a given situation are generated.
• A plan of attack towards a given problem is developed.
• Thought patterns are self-consciously deductive.
• Operations are organized into higher operations.

*The source is L. Joseph Stone and Joseph Church, *Childhood and Adolescence: A Psychology of the Growing Person,* Second Edition (New York: Random House, Inc., 1968).

THE CONSERVATION ASSESSMENT PACKAGE

The D.C. Title I program is primarily focused upon children and their educational development during the preoperational and concrete operations periods of cognitive development. During these periods the child undergoes extensive development of what is called "reversibility" and "conservation." One of the earliest instances of reversibility occurs for infants, with respect to the movements

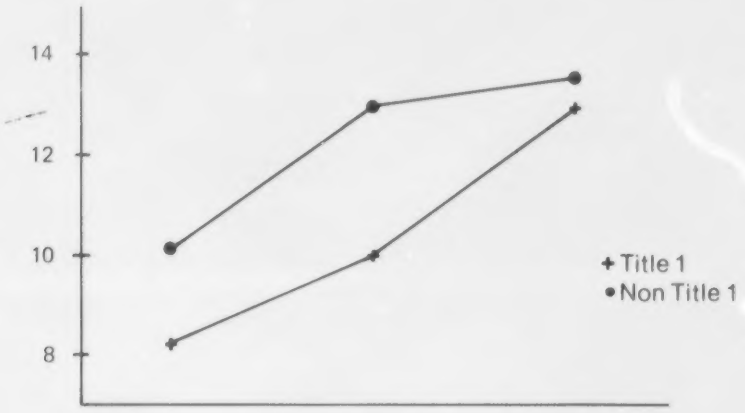
of objects. The ability to follow something's movements and then to physically or mentally place what has moved (or been moved) back where it started from, is an ability that must develop within the child. Jean Piaget hypothesises that, as a consequence of this development of reversibility in movements, the child develops a mental scheme of permanent objects distinct from and external to himself. The essential feature of development of reversibility is to be able to undo a change something has undergone. The correlative development is to be able to conserve the essential features of an object, even through changes in some other of the object's features. One of the first such developments is in the awareness of the continuity of an object's identity even though the object has changed its position. Other examples of the ability to conserve are realizing that the weight of an object is constant even though its shape is changed, realizing that an object's size is constant even though its shape is changed, or realizing that an object's size is constant even though its position or orientation is changed.

The *Conservation Assessment Package* (CAP) measures the child's ability to conserve in concrete situations. Because the increase in the ability to conserve is characteristic of the transition from the preoperational period to the period of concrete operations, the CAP gives an indication of the child's stage of cognitive development. The CAP is administered to one child at a time and consists of eight question pairs. Each question pair consists of presenting the child with a concrete situation and asking the child a judgmental question about the situation, and then if the child responds correctly, asking the child to explain why his response was correct. A typical situation might be to present a child with a ball of clay and then roll the ball out into a pancake. In this situation the first question might be, "which shape has more clay?" If the child says that they both have the same amount, then the child is asked to explain why. The CAP has a score range of from 0 to 16.

CONSERVATION PROFILES

The sample characteristics of the students who received the CAP are summarized in Figure 8.1. The CAP was administered to a total of 1059 students, but Figure 8.1 presents the characteristics of only 1024 students. The discrepancy appears because 35 individuals have neither a valid grade code nor a valid title* code.

FIGURE 8.1 MEAN CAP SCORES AND SAMPLE COUNTS
BY TITLE AND BY GRADE

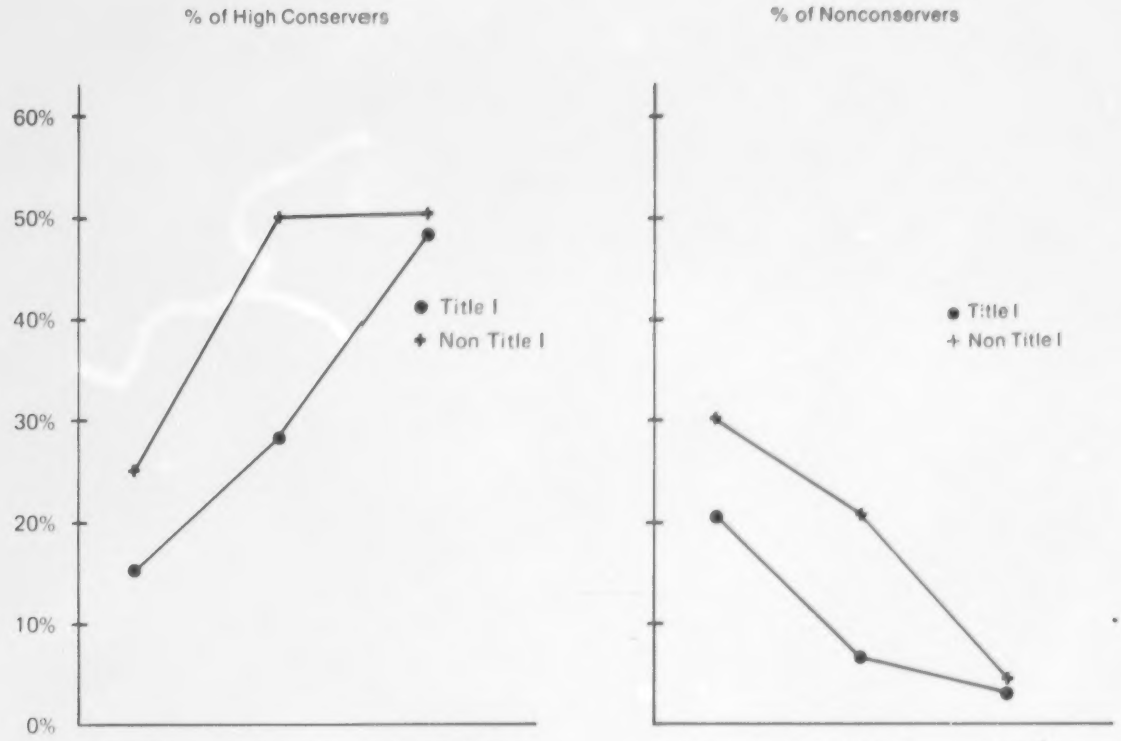


		Grade 1	Grade 2	Grade 3
	$\bar{X}$	8.04	9.90	12.72
Title 1	N	168	189	178
	$\bar{X}$	10.02	12.85	13.29
Non Title 1	N	153	179	164

*Title will be used as referent to the Title I program participation indicant.

An analysis of variance was conducted to determine the relative importance of grade, Title I program participation, and sex for the total CAP scores. Sex was found to be an insignificant factor either by itself ($F=2.367$ with 1 and 1005 DF), or through interaction with either grade or title ($F<1$), and consequently sex is not an important associate of the CAP results. On the other hand, title and grade were found to be highly significant as factors correlating with the CAP results, both by themselves ($F=42.5$ with 1 and 1018 DF, and $F=64.67$ with 2 and 1018 DF, respectively), and through interaction ($F=6.056$ and 2 and 1018 DF). In this analysis, however, title and grade were associated with only 14.3% of the variance of the total CAP score. This result should not be seen as surprising, since the CAP score is an indicator of the general level of individual cognitive development. Although the general pattern of development is the same for all children, the pace and texture of cognitive growth will differ, and the factors affecting cognitive development are much more complex than can be reflected by gross indicants of grade level and program involvement. In fact, it is highly doubtful if any school program or teacher can provide all of the stimuli and opportunities that such an individual, complex, continuous and pervasive development requires. Important questions do remain, and it can legitimately be asked whether a particular program or educational process does provide either the minimal or the optimal stimulus and opportunity that is called for by a child's or a group of children's development.

FIGURE 8.2 PERCENTAGES OF HIGH CONSERVERS AND NONCONSERVERS BY GRADES



	Grade 1	Grade 2	Grade 3
Title I	15.48%	28.57%	48.31%
Non Title I	24.84%	50.58%	50.61%

	Grade 1	Grade 2	Grade 3
Title I	29.17%	22.22%	5.06%
Non Title I	20.92%	6.98%	3.66%

An overall idea of the comparative cognitive development of the Title I and non-Title I student groups can be attained by examining Figures 8.1 and 8.2. Figure 8.1 displays the mean CAP score by grade for both groups, while Figure 8.2 displays by grade for both groups the percentages of students who are high conservers (perfect score or only one incorrect response) and nonconservers (no correct response up to only four correct responses).

Examination of these figures immediately reveals that both groups are continuing to develop and are progressing to successively higher levels of cognitive functioning. Another feature of these figures is that while, overall, the Title I mean CAP score is lower than that for the non-Title I students, the difference between the two groups becomes progressively smaller. For Title I students in grades 2 and 3, the mean CAP score is almost equal to the non-Title I mean CAP score for grades 1 and 2, respectively. A remarkable feature of these figures is that for the non-Title I group between grades 1 and 2, and for the Title I group between grades 2 and 3, there is a rapid development reflected in a large increase in the mean CAP score and in the percentage of high conservers, and reflected in a large decrease in the percentage of nonconservers. These indicators suggest a one year threshold period with a sudden growth followed by a plateau. The Title I pattern seems to be about one year later than the non-Title I pattern, and when it comes, the change for Title I students is almost the same as the change in the non-Title I students.

The CAP instrument has a score range of 0 to 16. The high mean CAP score and the high percentage of high conservers in the third grade could be an indication of a ceiling effect. On the other hand, the percentage of high conservers in both groups rises only to about 50%, while there is still a significant percentage of nonconservers in both groups. In light of these facts, and since the children in these grades are in the approximate period of transition from the Preoperational to the Concrete Operational stage of cognitive development, it seems reasonable to suggest that there actually is a threshold and plateau effect being observed. A good test of the validity of this assumption would be to extend the measurement range of the CAP instrument to avoid any possible ceiling effect contamination.

COGNITIVE DEVELOPMENT AND ACHIEVEMENT

The effect of cognitive development upon achievement, or the association of the CAP score with the achievement score, is of immediate interest to all Title I program staff. A child can assimilate only those aspects of the educational process for which he is prepared through previous cognitive development. For example, a child cannot learn to read before the development of the ability to use symbols. On the other hand, his previous educational experience must be thoroughly assimilated in order to ensure progress through successive levels of the educational process. For example, it does little good to explain something to a child before he understands what is being said, either because the child does not speak at all, or because a too developed and abstract vocabulary is being used. A child may have difficulty with the educational process through premature exposure to material that is inappropriate for his level of cognitive development. He may also be prematurely exposed to material that is dependent upon insufficiently assimilated aspects of his previous educational experience. In order to ensure that the child's long-term development is balanced and successful, the level and pace of the educational process should correspond to the stage of his cognitive development, and both should be simultaneously stimulated.

In order to assess the importance of cognitive development or CAP scores in association with achievement test results, analyses of covariance were conducted on the posttest reading and mathematics subscales and on the posttest battery total. A summary of the analyses results is presented in Table 8.2. The reliabilities of the achievement tests indicate that about 2/3 or 3/4 of the reliable variance in the posttest scores is being accounted for by the variable pool used in the analyses. The CAP scores are universally significant in association with the other variables used for predicting posttest achievement scores.

TABLE 8.2: ACHIEVEMENT POST TEST SCORES ANALYSIS OF COVARIANCE SUMMARIES

Factor	Post Reading	Post Mathematics	Post Battery Total
Grade	F = 53.54	F = 41.40	F = 38.01
Title	290.41	222.01	251.90
CAP	37.86	59.14	43.05
Pre Math	164.72	221.55	177.82
Pre Reading	135.85	43.51	95.13
Pre Battery Total	13.76	13.10	30.90
	R^2 = 0.5729	R^2 = 0.5319	R^2 = 0.5960
	N = 574	N = 578	N = 469

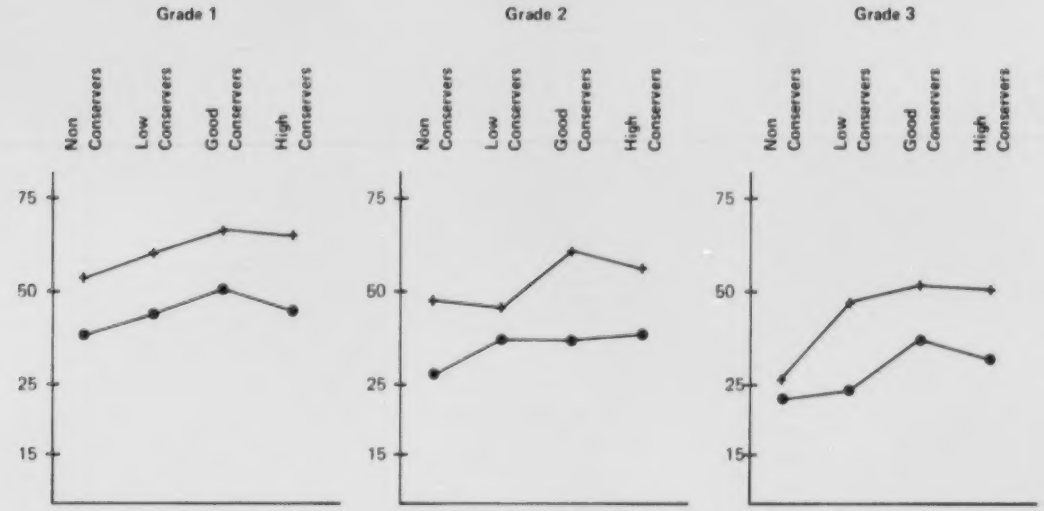
NOTE: These F statistics are for sequential F tests, and all have (P > F) = 0.0001, except for the Pre Battery total which has (P > F) = 0.0002 for Reading, and (P > F) = 0.0003 for Math.

In addition to the variables reported, the square of the CAP score and the square of the Pre Math and Reading scores were valid but proved not to be significant except for the square of the Pre Math score in the reading analysis (F = 6.43).

In Figures 8.3(a)-(c) the mean NCE profiles of the reading, mathematics and battery total score are displayed by grade and program membership, and by level of conservation ability or CAP score. The immediate impression of these figures is that the non-Title I profiles are universally higher than the Title I profiles for all test subscales and all grades, and throughout the range of conservation ability. The next impression of these figures is the general tendency of the mean scores to rise with conservation ability for all test subscales, in all grades, and for both groups. When taken together, and for all scales, grades, and groups, the high and good conservers always have better mean scores than the low and nonconservers. Within grade levels the upper end of the Title I profile generally reaches the range of the lower end of the non-Title I profile. Although the high and good conserving non-Title I mean scores never fall below the 50th NCE level, all of the displayed profiles have a tendency to decrease in general level from grade 1 to grade 3.

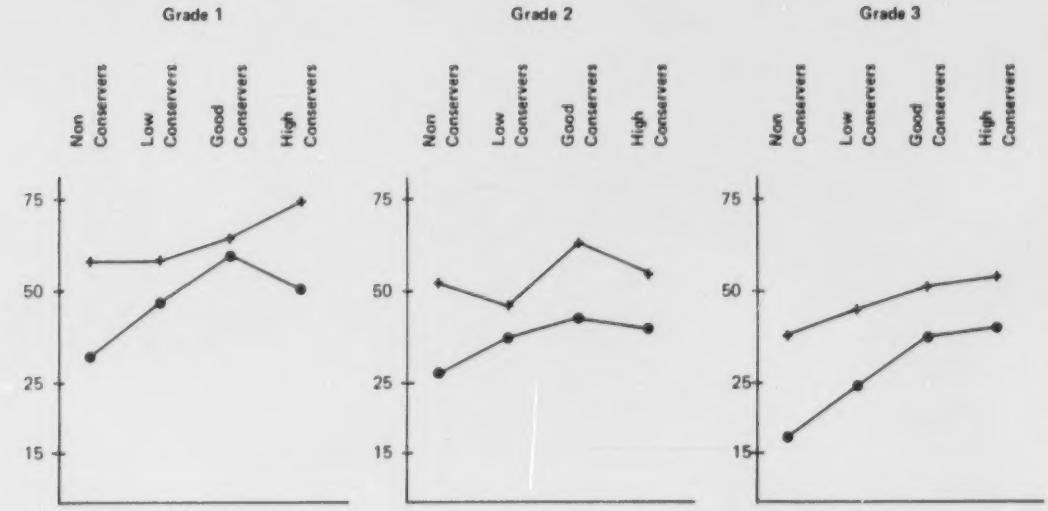
When interpreting these figures, it must be kept in mind that Title I students are selected because they are in need of supplementary service, and as a criterion of selection they should fall below the 50th NCE level on the achievement test, before participating in the Title I intervention program. The generally lower level of the Title I profiles is only to be expected as a consequence of this preselection. On the other hand, the Title I students with high or good conservation development generally at least approach, and sometimes surpass, the mean achievement level of the non-Title I students with low conservation development. This suggests that students who have relatively good cognitive development will generally derive more benefit from their educational experience than those who have relatively poor cognitive development, and that this increased benefit for good conservers can be independent of their pretest achievement level.

FIGURE 8.3(a): READING POST TEST ACHIEVEMENT NCE MEANS BY CONSERVATION LEVEL



		Grade 1				Grade 2				Grade 3			
Non Title I ◆	$\bar{X}$	54.36	60.64	66.03	65.48	48.83	47.89	61.44	57.07	26.00	46.89	51.27	51.23
	N	11	28	31	23	6	18	27	58	3	18	33	61
Title I ●	$\bar{X}$	39.77	45.30	50.68	46.80	26.83	38.82	37.39	39.59	22.75	23.97	36.50	33.81
	N	35	43	22	20	29	33	33	34	4	29	28	59

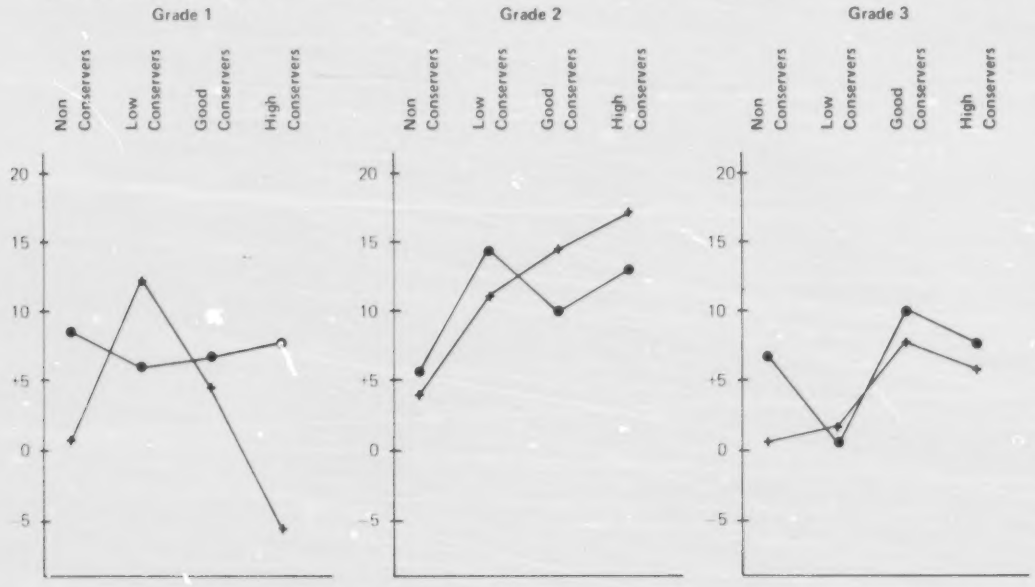
FIGIRE 8.3(b): MATHEMATICS POST TEST ACHIEVEMENT NCE MEANS BY CONSERVATION LEVEL



		Grade 1				Grade 2				Grade 3			
Non Title I ◆	$\bar{X}$	58.00	58.45	65.70	72.35	51.67	47.94	62.93	60.37	38.75	45.00	50.82	53.02
	N	11	29	30	23	6	18	28	56	4	19	33	62
Title I ●	$\bar{X}$	33.50	48.36	60.74	45.79	26.40	38.67	43.47	41.00	18.00	27.50	36.75	37.93
	N	38	42	23	19	30	36	32	37	5	28	28	60

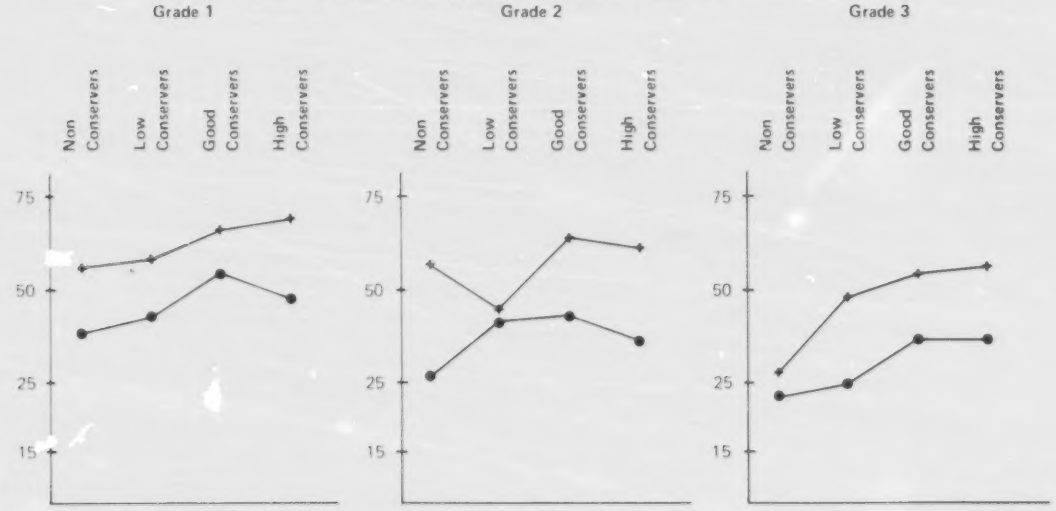
In Figures 8.4(a)-8.4(c), the mean NCE gains on the reading, mathematics and battery total achievement scores are displayed by scale and grade, and by conservation level. The mean gain scores have a general tendency to be higher with conservation level. When the two higher conservation groups taken together are contrasted with the two lower conservation groups taken together, there is an almost universal tendency for the higher two groups to have a better mean achievement gain than the lower two groups, and this is characteristic across scales, grades, and Title I program membership.

FIGURE 8.4(a): MEAN POST TEST READING NCE GAIN BY CONSERVATION LEVEL



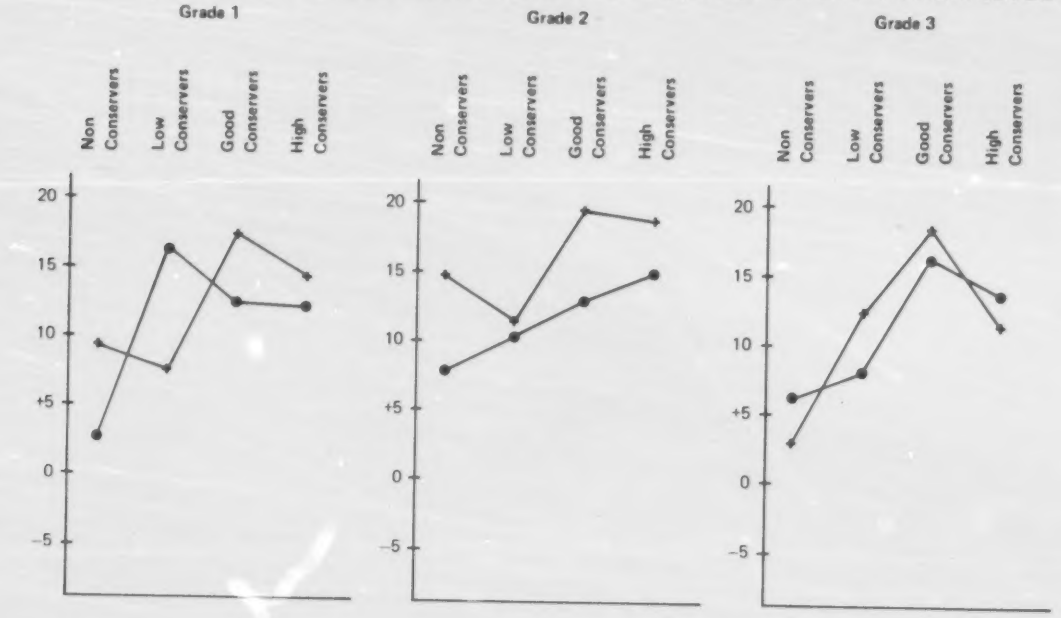
		Non Conservers	Low Conservers	Good Conservers	High Conservers
Non Title I ✦	Grade 1	1.00	12.08	4.37	-5.24
	Grade 2	3.38	11.25	14.25	16.58
	Grade 3	0.33	1.88	7.48	5.87
Title I ●	Grade 1	8.73	5.56	6.28	7.41
	Grade 2	5.54	13.94	9.77	12.82
	Grade 3	6.75	0.41	9.29	7.43

FIGURE 8.3(c): BATTERY TOTAL POST TEST ACHIEVEMENT NCE MEANS BY CONSERVATION LEVEL



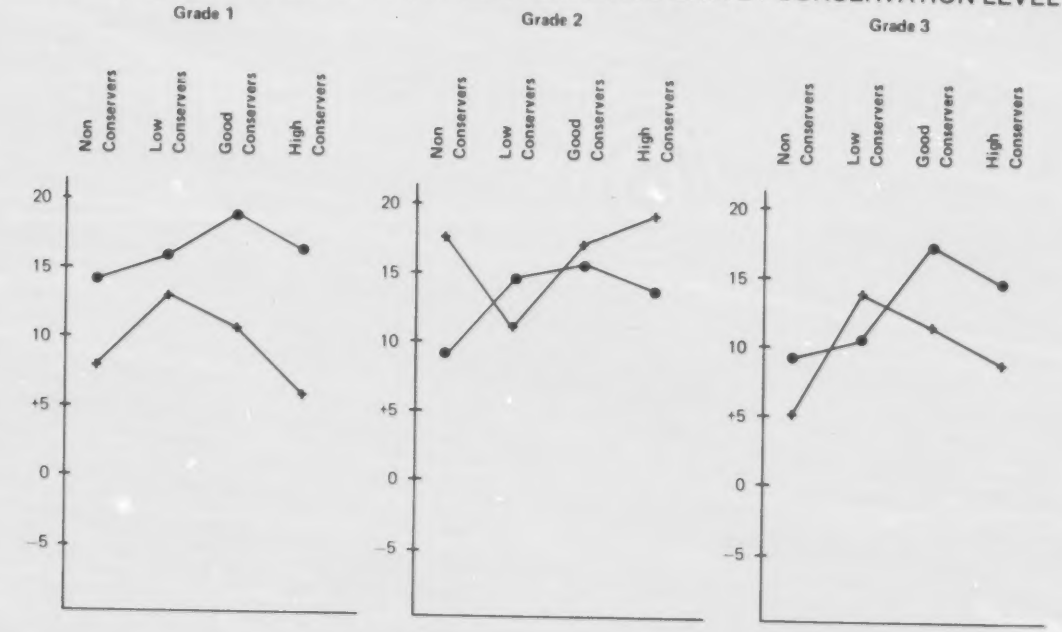
			Non Conservers	Low Conservers	Good Conservers	High Conservers
Non Title I ✦	Grade 1	x̄	55.20	57.84	66.08	67.68
		N	10	25	26	22
	Grade 2	x̄	56.25	44.08	62.58	61.14
		N	4	13	19	42
	Grade 3	x̄	27.67	46.33	52.81	53.82
		N	3	12	27	44
Title I ●	Grade 1	x̄	38.14	43.47	55.43	49.25
		N	29	38	21	16
	Grade 2	x̄	25.09	40.16	40.61	35.29
		N	21	25	28	28
	Grade 3	x̄	20.50	24.77	35.91	35.48
		N	4	22	23	42

FIGURE 8.4(b): MEAN POST TEST MATHEMATICS NCE GAIN BY CONSERVATION LEVEL



	Grade 1				Grade 2				Grade 3			
Non Title I ✦	9.45	7.96	16.70	14.15	14.83	11.06	19.07	18.40	3.00	12.53	17.77	11.85
Title I ●	2.84	15.76	12.82	12.44	7.48	9.91	12.47	14.37	6.00	7.77	15.48	13.31

FIGURE 8.4(c): MEAN POST TEST BATTERY TOTAL NCE GAIN BY CONSERVATION LEVEL



	Grade 1				Grade 2				Grade 3			
Non Title I ✦	8.00	13.52	11.39	5.58	17.5	11.27	17.31	18.14	5.0	13.36	11.2	9.05
Title I ●	14.44	15.74	18.47	16.69	9.07	14.61	15.72	13.84	9.0	10.15	16.65	14.81

Another suggestive aspect of Figures 8.4(a)-8.4(c) is the general tendency for the Title I group to have a greater mean gain by conservation level in grades 1 and 3, while the non-Title I group has a generally greater mean gain by conservation level in grade 2. This is particularly striking when considered together with the developmental lag suggested for Title I students during grade 2. In grade 2 the comparative successes for Title I students occur only in the non or low conserving group and for the reading subscale (and as a result for the battery total).

The lack of complete consistency in the differences between the patterns of gain scores for the Title I and non-Title I groups is a reminder of the complexity of the processes of cognitive development and education, and of their interaction with each other and with the multidimensional complexity of the child's personality and milieu. The CAP score itself is only a gross indicator of just one significant dimension of the child's cognitive development and leaves completely untouched the real breadth of developing ability that all children are experiencing during these years. Other aspects of cognitive development such as attention span, long and short-term memory, field dependence and independence, cognitive simplicity and complexity, conceptual differentiation, and myriad other identified aspects of the child's developing ability are not measured at all by the CAP score. Beyond these mainly cognitive dimensions are other important factors, such as motivation and self-concept, and indeed, the complete spectrum of affective and personality factors.

In spite of the complexity of the developmental and educational processes, and using just a single measure of cognitive development, remarkable results are obtained indicating significantly differentiated growth profiles for the Title I and non-Title I groups, and indicating a consistent difference in educational benefit, based upon successive stages of cognitive development. These findings implicitly suggest the possibility and benefits of developmental diagnostics and appropriate remediation measures.

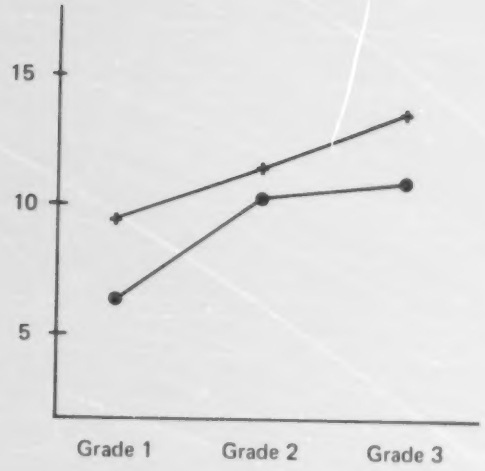
COGNITIVE DEVELOPMENT AND THE CHILD

In order to assess the association of cognitive development or CAP score with other aspects of the child's background and growth, mean CAP score profiles are displayed and considered as they are differentiated by the response categories of various questions on the Student Information Form (SIF). Because the CAP score is a developmental measure, the mean CAP scores are displayed by grade. In order to understand the CAP score differences as differentiated by the SIF variables, the Title I and non-Title I groups will be averaged together, and the CAP scores will be considered independently from the effect of the pretest achievement score differences, which are associated with Title I program participation.

When interpreting the figures associated with this section, it must be kept in mind that analysis of the SIF responses has suggested that there might be a tendency upon the part of teachers to project onto the student stereotypic qualities associated in the teacher's mind with Title I Program participation (see the discussion of the SIF in chapter 5). This possibility of teacher projection is another strong reason for considering the SIF form variables, in conjunction with the CAP scores, independently of Title I program participation. It is possible to presume that a consistent process of projection associates all of the more poorly regarded stereotypes with Title I students. The pattern of CAP score differences displayed in this section might possibly be explained merely as a consequence of such a process of consistent projection, because the Title I group does exhibit a remarkable pattern of delayed cognitive development when compared to the non-Title I group. Fortunately, while very noticeable, the possible bias introduced by teacher projection into the quality of information reported on the SIF is not uniform, and all categories of response for SIF variables do have a mixed sample of Title I and non-Title I students.

In Figure 8.5 the mean CAP score by grade is displayed for those students who are indicated as having kindergarten experience as contrasted with those who are not. There is a noticeably lower profile for those students without kindergarten experience. Unfortunately the contrast in sample size is so extreme that the very small number of students who have no kindergarten experience reported makes any conclusion tenuous. Nevertheless, the profiles do suggest either that kindergarten is good for the child's cognitive development, or that parents very sensibly send to kindergarten only those students who are developmentally ready for the experience.

FIGURE 8.5: KINDERGARTEN ATTENDANCE AND CONSERVATION

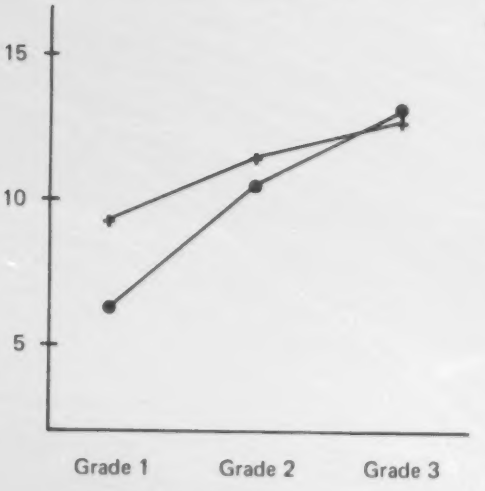


Did the student attend kindergarten?

		Grade 1	Grade 2	Grade 3
+ = YES	$\bar{X}$	9.26	11.44	13.13
	N	197	211	166
● = NO	$\bar{X}$	6.53	10.12	10.20
	N	17	17	5

In Figure 8.6 the mean CAP score by grade is displayed for those students who are indicated as having family support as contrasted with those who are not. There is again a real disparity in sample sizes, although those children who are indicated as not having family support are numbering about 25 to 35 for each grade in this sample. The differences associated with this variable seem to be important early in the child's cognitive development, and to give the encouraged child a temporary advantage in the transition to the Concrete Operations stage.

FIGURE 8.6: FAMILY SUPPORT AND CONSERVATION

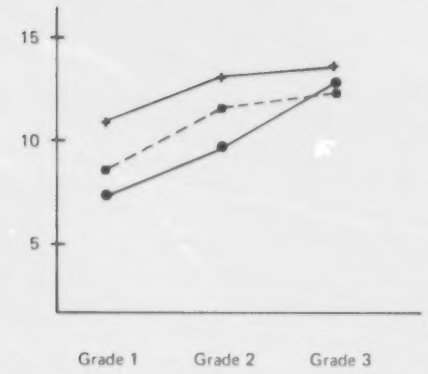


To your knowledge, is the student's family supportive of his/her efforts?

		Grade 1	Grade 2	Grade 3
+ = YES	$\bar{X}$	9.50	11.59	12.94
	N	203	211	171
● = NO	$\bar{X}$	6.42	10.60	13.09
	N	26	35	35

In Figure 8.7 the mean CAP score by grade is displayed as differentiated by the extent to which perseverance is regarded as being one of the student's positive strengths. There is a consistent association of higher mean CAP scores with higher levels of perseverance for all grades. The previously noticed pattern of a one-year developmental lag is associated with the students of the lowest perseverance. Perseverance can be ambiguously interpreted as either a demonstration of determination and will power, in which case it could reasonably be asked if perseverance might amplify or accentuate cognitive development, or perseverance can be interpreted as a manifestation of attention span or concentration, in which case it could reasonably be expected to be a result of cognitive development. In any case, the association remains.

FIGURE 8.7: PERSEVERANCE AND CONSERVATION



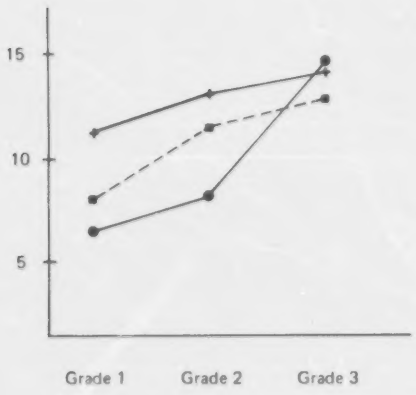
Which, and to what degree of the following areas do you perceive as being the student's positive strengths?

Perseverance		Grade 1	Grade 2	Grade 3
—— ◆ = 5, High	$\bar{X}$	11.11	13.23	13.52
	N	57	64	50
= 4	$\bar{X}$	9.33	10.96	13.49
	N	45	48	43
- - - ■ = 3	$\bar{X}$	8.69	11.71	12.53
	N	58	65	49
= 2	$\bar{X}$	8.00	9.45	12.68
	N	31	29	28
—— ● = 1, Low	$\bar{X}$	7.58	9.00	12.54
	N	19	22	28

NOTE: Only the extreme and middle groups from this Table have been graphed in the interest of being able to see something other than a noninterpretable jumble and confusion of lines.

In Figure 8.8 the mean CAP score by grade is displayed by the extent to which motivation is considered to be one of the student's positive strengths. There is an almost completely consistent pattern of higher mean CAP scores for higher levels of motivation for all grades. The pattern of developmental lag is noticeable for those students characterized as being low in motivation. It has been suggested that high motivation causes success, and also that success engenders enthusiasm and interest. In an earlier section a strong tendency was noticed for good conservers to have better achievement scores than poor conservers. This link could explain some of the association of relatively high motivation and conservation. On the other hand, conservation develops as a result of active participation in experiencing by the child, and a more highly motivated and active child could have a developmental advantage in comparison to those with low motivation.

FIGURE 8.8: MOTIVATION AND CONSERVATION



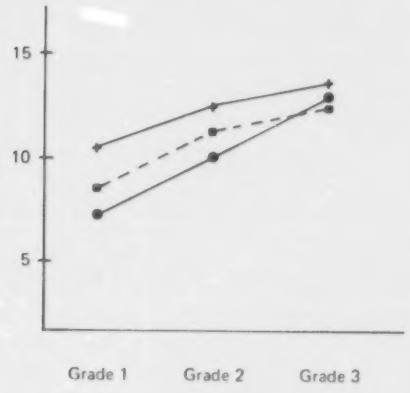
Which, and to what degree of the following areas do you perceive as being the student's positive strengths?

Motivation		Grade 1	Grade 2	Grade 3
—— ◆ = 5, High	$\bar{X}$	11.28	12.82	13.58
	N	61	71	50
= 4	$\bar{X}$	10.00	12.04	13.17
	N	56	48	40
- - - ■ = 3	$\bar{X}$	8.15	11.31	12.94
	N	52	68	62
= 2	$\bar{X}$	7.63	9.04	10.75
	N	30	27	28
—— ● = 1, Low	$\bar{X}$	6.46	8.29	13.95
	N	13	21	20

NOTE: Only the extreme and middle groups from this Table have been graphed in the interest of being able to see something other than a noninterpretable jumble and confusion of lines.

In Figure 8.9 the mean CAP score by grade is displayed by differences in the degree of responsibility which the teacher assesses to be characteristic of the child. There is a general tendency for higher conservation development levels to be associated with higher responsibility. There are no apparent differences in developmental patterns for different degrees of responsibility.

FIGURE 8.9: ACCEPTANCE OF RESPONSIBILITY AND CONSERVATION



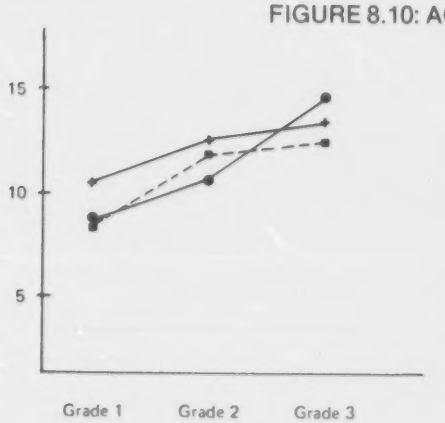
Which, and to what degree of the following areas do you perceive as being the student's positive strengths?

Accepts Responsibility		Grade 1	Grade 2	Grade 3
✦ = 5, High	$\bar{X}$	10.71	12.92	13.73
	N	62	80	55
= 4	$\bar{X}$	9.92	11.17	12.83
	N	50	46	47
● = 3	$\bar{X}$	8.45	11.77	12.14
	N	56	61	57
= 2	$\bar{X}$	7.50	7.72	13.11
	N	24	29	19
● = 1, Low	$\bar{X}$	7.17	10.48	12.90
	N	18	21	21

NOTE: Only the extreme and middle groups from this Table have been graphed in the interest of being able to see something other than a noninterpretable jumble and confusion of lines.

In Figure 8.10 the mean CAP score by grade is displayed as it is differentiated by the degree to which the student is considered by the teacher to have aggressiveness as a positive strength. There is a general tendency, though far from universal, for higher levels of accepted aggressiveness to be associated with higher levels of conservation ability. The ambiguity in the patterns of conservation level might be a result of the diversity of causes which generate aggressive behavior patterns. In particular, when considered in relation to level of cognitive development, aggressive patterns could be energized by confidence and enthusiasm that are a result or conclusion of good cognitive development. On the other hand, aggressive patterns could be energized in an attempt to compensate for insecurity, or as an expression of frustration, that might result from a relatively low cognitive development and its associated achievement levels. Without further data, the general pattern and its ambiguity remain.

FIGURE 8.10: AGGRESSIVENESS AND CONSERVATION



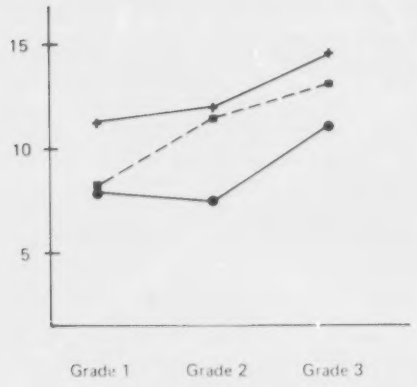
Which, and to what degree of the following areas do you perceive as being the student's positive strengths?

Aggressiveness		Grade 1	Grade 2	Grade 3
✦ = 5, High	$\bar{X}$	10.70	12.42	13.38
	N	37	45	39
= 4	$\bar{X}$	10.55	10.78	12.58
	N	42	51	36
● = 3	$\bar{X}$	8.53	12.14	12.82
	N	62	66	68
= 2	$\bar{X}$	8.00	10.75	12.07
	N	35	28	30
● = 1, Low	$\bar{X}$	8.78	10.54	14.05
	N	23	26	20

NOTE: Only the extreme and middle groups from this Table have been graphed in the interest of being able to see something other than a noninterpretable jumble and confusion of lines.

In Figure 8.11, mean CAP scores are displayed by grade and as differentiated by the degree to which peer interaction is a positive strength of the student. There is a very uniform pattern of higher conservation level associated with a higher degree of positive peer interaction. The single anomoly is for the low interaction group in grade 1. There seems to be a tendency for developmental lag in those students who are weakest in positive peer interaction. This pattern does associate with the positive developmental benefit that children do derive from healthy social stimuli.

FIGURE 8.11: PER INTERACTION AND CONSERVATION



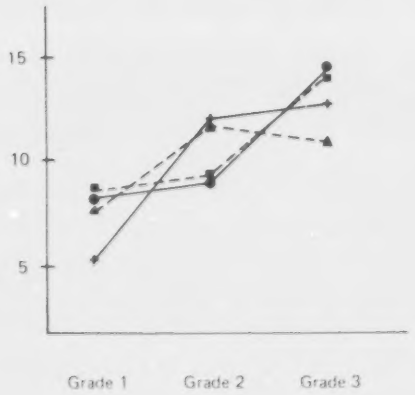
Which, and to what degree of the following areas do you perceive as being the student's positive strengths?

Peer Interaction		Grade 1	Grade 2	Grade 3
✦ = 5, High	$\bar{X}$	11.49	12.28	14.14
	N	37	60	43
= 4	$\bar{X}$	10.50	11.89	12.92
	N	58	62	53
● = 3	$\bar{X}$	8.28	11.72	12.97
	N	72	78	70
= 2	$\bar{X}$	6.96	9.42	11.74
	N	27	24	27
● = 1, Low	$\bar{X}$	8.25	7.80	11.00
	N	8	5	6

NOTE: Only the extreme and middle groups from this Table have been graphed in the interest of being able to see something other than a noninterpretable jumble and confusion of lines.

In Figure 8.12 mean CAP scores are displayed by grade for various factors which interfere with the educational progress of some students. In each grade, for each of these factors, the sample sizes are very small and any perceived patterns must be considered very tentatively. The remarkable feature of this figure is that the profiles split into two very similar patterns. Those students who are seen by the teacher as resenting authority, and whose pattern of peer interaction interferes with their educational progress, seem to have a one-year developmental advantage over those students who are physically or verbally disruptive.

FIGURE 8.12: INTERFERING AREAS AND CONSERVATION

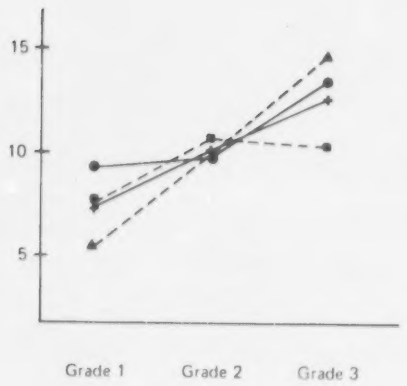


Which of the following areas do you perceive as interfering with the student's educational progress?

		Grade 1	Grade 2	Grade 3
● = Physically Disruptive	$\bar{X}$	8.07	8.76	14.50
	N	14	17	14
✦ = Peer Affinity	$\bar{X}$	5.36	12.33	12.44
	N	14	21	25
● = Verbally Disruptive	$\bar{X}$	8.13	8.74	12.72
	N	24	23	18
▲ = Resents Authority	$\bar{X}$	7.57	12.31	11.07
	N	7	16	15

In Figure 8.13 mean CAP scores are displayed by grade as they are differentiated by a selection of problem areas which might cause some students to be referred to Pupil Personnel Services. With only two exceptions the main pattern is for very homogeneous levels rising together and uniformly through the grade sequences, and without any differences in developmental patterns. The two exceptions are the unusually high relative cognitive development characteristic of those students who have problems with aggression in grade 1, and the unusually low relative cognitive development of those students who are seen as being in particular economic need in grade 3.

FIGURE 8.13: PROBLEM AREAS AND CONSERVATION

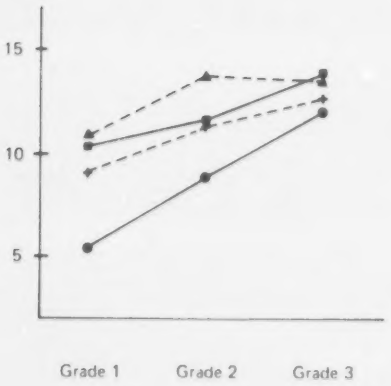


Does the student have any of the following problem areas which would require him/her to be referred to the Pupil Personnel Service Department?

		Grade 1	Grade 2	Grade 3
— ✦ = Withdrawn	$\bar{X}$	7.33	10.07	12.72
	N	9	15	18
— ● = Agressive	$\bar{X}$	9.18	9.73	13.08
	N	28	22	24
- - - ● = Economic Need	$\bar{X}$	7.36	10.90	10.50
	N	14	10	8
- - - ▲ = Excessive Absenteeism	$\bar{X}$	5.71	9.75	14.50
	N	7	4	2

In Figure 8.14 the mean CAP score is displayed by grade and as differentiated by the priority that the teacher would assign to the student for special services offered by the Title I program. There is a uniform pattern of higher assessed need for services to be associated with lower cognitive development. This is a valuable and important correlation of the previously discussed association of program participation and a lower cognitive development profile, and a lower achievement profile. This pattern of association between comparatively lower cognitive development and the teacher's assessment of the priority of the student's need for Title I services once again suggests the possibility of a developmental diagnostic instrument and a developmentally focused intervention.

FIGURE 8.14: SERVICE PRIORITY AND CONSERVATION



Considering the needs of the students in your school, what priority would you assign to this student for special services offered through the Title I program?

		Grade 1	Grade 2	Grade 3
— ● = High	$\bar{X}$	6.37	8.94	11.86
	N	54	63	58
- - - ✦ = Moderate	$\bar{X}$	9.14	11.26	12.86
	N	74	81	65
— ● = Low	$\bar{X}$	10.45	11.52	13.89
	N	31	29	27
- - - ▲ = None	$\bar{X}$	10.92	13.34	13.72
	N	71	77	60

The reported patterns of association between levels of cognitive development and a wide variety of personality characteristics, behavior patterns, and social factors are a clear indication of the complexity of the developmental process which a child experiences during these years. Because of the clear link between a child's level of cognitive development and the degree to which a child benefits from the educational process, the significance of the developmental process for both the child and for society as a whole cannot be denied. The results reported in this chapter indicate only a few of the possible associations between the myriad interacting dimensions of the developing child. The patterns of association as reported here should not be interpreted as a conclusive description of the causal structure governing the child's development. The causal pattern of the developmental process must be understood, however, and the developmental stage of the child must be known, in order to provide assistance and instruction which is appropriate to the child, and which is assured of giving the best possible opportunity for success.

CHAPTER IX
INSTRUCTIONAL PROCESS ANALYSIS

This evaluation of the process component of the Title I program for the District of Columbia schools began January 1977 with several conferences organized to examine and, if necessary, modify the research instruments used in previous years. Principals, teachers, and Title I administrators as well as representatives from the Division of Research and Evaluation of the District of Columbia public schools participated. How could information be reported and used? Most participants felt that superfluous information had been collected in previous years and that attention had been paid more to negative aspects of the project than to positive ones. The decision was thus made to focus this time on the strong points of Title I students and teachers. As part of this effort a completely new teacher aide questionnaire was developed based on the form the teachers themselves used to evaluate their aides. It focuses both on what the aides actually do and on what they expect of themselves.

The questionnaire used here for resource teachers was first employed during the 1975-76 school year in a substudy. It is designed to provide data which will help more clearly define the role of the resource teacher. A questionnaire for principals was also developed to elicit responses on a wide range of topics. Principals were asked to return this questionnaire in a sealed envelope in the hope that this would increase the response rate for principals and encourage them to candidly evaluate their role in the Title I program.

This year the teacher, aide and resource teacher questionnaires were delivered to each individual school by a member of the NTS staff. A deadline of May 27 was established for their completion, thus allowing a week and a half to two weeks for their return.

The final design meeting held with representatives from all Title I schools suggested other changes in the testing program as well. Participants, for example, said that testing should begin earlier, that more precoded forms for students (and possibly also for teachers) should be employed and that more information should be provided to teachers and school officials concerning the nature of the research and the research findings. As a result of this last suggestion, the "Executive Summary" and "Implications and Recommendations" chapters of the 1975-76 Title I report were distributed to each of the schools at the same time as the questionnaires.

Teachers

Eight hundred teacher questionnaires were delivered to Title I schools. NTS received 431 completed forms, a smaller percentage than in previous years. Responses were obtained from 169 first grade teachers, 116 second grade teachers and 124 third grade teachers. Sixteen fourth grade teachers and one seventh grade teacher also filled out the questionnaire but their responses are not reported.

According to the Title I teachers responding to the questionnaire, teachers exert somewhat more influence on the academic achievement of students than do parents and much more is exerted by either peers or other adults. And the teachers believe that a firm, no-nonsense approach is more effective in teaching basic skills. They recognize, though, that children also need a classroom environment which provides love and emotional support. Perhaps the main reason the no-nonsense approach is endorsed so strongly is that teachers apparently feel that children usually do not do what is best for themselves when given free choice. At any rate, in terms of giving individual attention to students (an aim teachers strongly support), respondents indicated that slower children should receive most of the teacher's attention because brighter children do all right on their own.

But how do teachers assess individual student needs in order to individualize instruction? They rely most, they said, on their own classroom observation and on teacher-constructed tests. A con-

siderable number, however, indicated that they place most emphasis on achievement tests. Norm-referenced tests are used most to determine a child's relative position in class and to assess his or her academic progress. Criterion-referenced tests are also used to examine academic progress but in addition to help a teacher "understand" a student's performance.

The teachers were also asked more specific questions about different types of tests. They said that criterion-referenced tests were most useful in general followed in order of usefulness by standardized tests, teacher-made tests, informal surveys conducted by teachers, and, finally, tests provided by textbook manufacturers as part of their textbook program. Most teachers felt that standardized tests are useful primarily because such tests indicate how a teacher's own students compare with other students.

What teaching strategies do the Title I teachers employ? A majority of those in the sample said that students can be motivated to learn by using preplanned lessons but at the same time paying attention to the personalities of the students, by knowing about a student's emotional, cognitive and physical readiness to function at the grade level of the class in which he or she is placed. Again, teachers endorsed a firm no-nonsense approach and said that it is very important to clearly establish and reinforce appropriate performance expectations on the part of students. They placed far less emphasis on giving a child praise and the chance to do something he or she likes after completing a task and least of all on using a warm, accepting approach designed to instill confidence in the child.

This task orientation and emphasis on expectations were also obvious when teachers were asked how they would handle various disciplinary problems. They said that a student who, for instance, continually or for the first time exhibits disturbing behavior in class should be started on his academic work. Fewer than half the respondents endorsed any of the other alternatives listed on the questionnaire (to tell the student in front of the class to stop his disruptive activity, to whisper this to him, to pay no attention to him at all or to communicate displeasure nonverbally). Respondents, on the other hand, strongly endorsed the view that the best way to eliminate unwanted behavior in the long run is to understand its cause and to act on this understanding, especially to understand the satisfaction a child derives from disruptive behavior.

In terms of what teachers usually do in class, they reported spending most time on self-selected silent reading on the part of students. Approximately equal amounts of time were spent on the other activities listed on responding to oral or written literature, on composing a story or letter, on decoding sentences, on encouraging other students to engage in creative writing and on student-dictated stories or poems.

Teachers also used five point scales (going from 1 for "none" or "never" to 5 for "a lot" or "very frequently") to indicate the instructional methods they used. They said they assigned a moderate amount of homework daily in both math and reading— a modal score of 3 in each case— and that peer tutoring was also used to a moderate extent (also a mode of 3). Teachers reported in addition that games and/or contests were frequently used to teach math and reading and that students almost never grade their own tests. Students seemingly have little decision-making power in the classroom— very rarely deciding how they want to work and next to whom they will sit (with modes of 2 for each of these items).In terms of time spent on various activities, teachers reported spending an average of about 60 minutes a day on mathematics instruction and 90 minutes a day on reading or reading-related instruction.

As far as handling poor student performance is concerned, for a student who does not pass a test in mathematics, the teacher generally provides tutoring, gives special work or repeats the material covered (30% of the teachers selected each option). In reading, the strategy is essentially the same although special work is given somewhat more frequently in this case. Students are generally self-placed in both reading and mathematics but somewhat less so in the latter. This reflects the fact that math instruction is given to the entire class as a whole more often than is reading instruction.

How do respondents explain poor achievement in school? The most serious problem, they said, was having too many children in the classroom. Of the seven factors whose importance they rated,

respondents indicated that a lack of appropriate instructional material was the least important one. The second most important problem, they felt, was inadequate home training of children. This was followed in order of importance by a lack of readiness on the student's part, by inadequate placement of students in the program, and by too many duties for teachers outside the classroom.

Teachers also indicated what factors limit their own teaching effectiveness. They cited as most important lack of efficient planning time, lack of appropriate materials, and excessive paper work.

Turning now to Title I itself, as far as language difficulties of Title I students are concerned, most teachers felt that nonstandard English interfered somewhat with a student's academic progress, although almost a third suggested this was not really a problem. (Most teachers, it should be noted, said that speaking nonstandard English reflects environmental exposure and not low intelligence.) Nevertheless, a majority of the teachers said that students with regional dialects should be encouraged to switch to mainstream English.

There was considerably more agreement among teachers concerning the basis on which over-age students should be promoted to the next higher grade. Although almost half the respondents felt that teacher and principal recommendations should carry weight, one quarter felt that either the child's maturity or his or her performance on teacher-designed tests should be the primary determinant.

That teachers prefer to rely most on their own judgment also emerged in two other ways. Teachers were asked, first of all, how the supplementary program content used in Title I classes should be selected. They hoped for direct involvement here. More than half felt that this content should be based on the curriculum guide worked out by the teachers and principal. Another 28% said that the curriculum team (including teachers, parents, and so on) should decide this. Very few respondents endorsed selection by textbooks, by the U.S. Office of Education or by the Title I program staff.

Respondents were also given a list of ten situations and were asked to indicate for each whether teachers should be made to follow the rules strictly, should be asked to follow the rules but be permitted to make changes they felt necessary or should be completely free to use their own judgment. Teachers said rules should be applied strictly only in deciding working hours. They indicated that they should use their own judgment in deciding how to help a child who is not working well, in correcting a child's mistakes and in deciding whether or not to contact a child's parents. In the remaining situations teachers felt that the rules should be modified, at the teachers' initiative, to fit situational needs.

As far as the organization of Title I is concerned, most teachers felt that the goals and objectives of the program had changed somewhat since they became involved in it. Most teachers, in this regard, indicated that they had access to a Title I curriculum handbook last year. Of these 84.4% said they had no problems implementing the instructional program outlined in the handbook. Those few reporting problems indicated that the time available was insufficient (51.5%), that a lack of instructional materials hindered them (31.5%) or that they needed more training or study on how to implement the handbook's suggestions (16.9%).

The handbook deals in part with the use of audiovisual equipment. Teachers were asked whether they use each piece of equipment with small groups, with individual students or with the entire class. None of the equipment was used with individuals. The movie projector, filmstrip projector, overhead projector, record player, and radio and TV set were used with the entire class; the tape player was used mainly with small groups.

Teachers were also asked how often their students use the school library as a learning resource. Most indicated that they use it between once a week and once a month. Respondents usually felt that both the school library and their own class library had adequate materials.

How should teachers insure that they keep up to date, that they learn about new techniques and equipment? Most said the most important approach was to take additional courses. In order of

preference, reading professional literature was next followed by attending professional meetings and discussion groups. Conducting independent research was stressed least.

In terms of such courses, more than half the respondents reported attending at least one (and usually two or three) staff development activities last year. And they evaluated these activities relatively positively as to relevance, impact and the usefulness of resource materials provided. (Three quarters of the teachers see the goals of the CBC and Title I as related.) Those who did not attend these activities usually said that this was because they were not informed about them or, in second place, that they did not have proper coverage of their classroom. Almost nobody indicated lack of interest. A majority of respondents felt, however, that too few credits were awarded for the courses. As to when these activities should be scheduled, most teachers preferred afternoon meetings and rejected Saturday meetings altogether.

Of those teachers attending inservice courses, 44.6% were taking courses in reading and language Most teachers—who usually found out about these inservice courses from the Title I staff and somewhat less frequently from their principal—felt that their school adequately supported Title I materials used were appropriate, only 72% of those in the reading/pupil personnel courses said so. Almost half, however, indicated that Title I does not do a good job of keeping teachers informed about new trends and techniques in compensatory education. Almost all of the teachers nevertheless reported that they would like more inservice courses next year — in all areas.

Respondents were asked whether they had made any change in their teaching techniques as a result of the inservice courses they had taken. Some 71.2% said they had changed their approach in some way. When asked precisely how these courses had changed their approach, the largest number of teachers reported changing their instructional techniques, an increased knowledge of pupil assessment, and an added use of materials and equipment. Interaction with aides and pupil assessment changed least as a result of their courses. As far as the topic coverage is concerned, teachers ranked the relative usefulness of topics in this order: knowledge of the Title I child, knowledge of the Title I program, use of materials, knowledge of course content and pupil assessment (least useful).

Teachers, finally, were asked about their teacher aides. Most responded that they do have a paid Title I teacher aide, the majority for less than half a day for three or five days per week and for a full day once or twice a week. They said they used their aide several times a month to help prepare instructional materials and to reinforce learning by conducting drills or games with the students. They used them more often (several times a week) to distribute and collect instructional materials, to check written work, to update progress reports, to prepare charts and other records, to assist pupils with individual learning tasks and to assist pupils with minor behavioral problems or personal needs. They were used only periodically to prepare and arrange bulletin boards and displays.

Teachers were also asked how important it is for a teacher's aide to possess various characteristics. While almost all of the 25 listed characteristics were rated as very important and the remainder as important, some significant differences in emphasis were found. Teachers for instance felt that having good rapport with school personnel other than teachers was less important than having good relations with teachers and students. In terms of personal characteristics, furthermore, respondents felt that it was most important for an aide to be reliable and least important for an aide to be resourceful. Regular attendance on the part of the aide was also very highly stressed— somewhat more so than the more creative qualities of industriousness and initiative. As far as the aide's relations with pupils are concerned, being able to work with individuals and small groups and understanding and applying knowledge of individual differences among children were stressed over specific technical skills such as skill in distributing, collecting, and inventorying instructional materials and equipment and knowing how to operate audiovisual equipment.

Teacher Aides

The Title I program description for the 1976-77 school year describes in detail the functions the teacher aide is to perform—relieving the teacher of many necessary but time-consuming tasks, organizing daily classroom activities (such as reading stories, preparing flash cards and supervising word games), administering teacher-made tests, planning small group activities, operating audiovisual equipment, and maintaining files and recording test scores. According to the program description there is to be one aide for every 50 Title I students, with the aides paid at the GS4 level.

To get an idea of what aides actually do in class they were first asked (as were the teachers) how frequently they engage in each of the activities shown in Table 9.1. Responses could range between 1 (for "never") and 6 (for "several times a day"). As this table shows, aides most frequently assisted pupils individually with learning tasks (somewhat more often than once a day) and slightly less often distributed and collected instructional material and assisted pupils with minor behavior problems and personal needs. They least frequently prepared and arranged bulletin boards and other displays and set up and operated audiovisual equipment, usually performing each of these tasks only several times a month. The remaining activities were engaged in several times a week.

Table 9.1 Mean Frequency with Which Teacher Aides Report Engaging in Various Classroom Activities

Activity	Mean*
Distributing, collecting instructional material	4.98
Checking pupils' written work, updating progress charts	4.56
Preparing, arranging bulletin boards, displays	2.74
Helping prepare instructional materials	4.16
Setting up, operating audiovisual equipment	2.79
Reinforcing learning by conducting drills, games	4.60
Assisting pupils individually with learning tasks	5.38
Assisting pupils with minor behavior problems, personal needs	4.92

*Items are scored from 1 (for "never") to 6 (for "several times a day"). A higher score indicates that an activity is engaged in more frequently.

It is interesting to note that the teachers see the aides' activities somewhat differently than the aides do themselves. As we saw, the teachers were also asked how often their aide engaged in each of these activities (except for setting up and operating audio-visual equipment). Teachers and aides more or less agreed only on how often aides prepared and arranged bulletin boards and displays and assisted pupils with minor behavior problems and personal needs. For all of the remaining items aides reported engaging in each activity much more often than teachers said they did. This was especially true for assisting pupils individually with learning tasks (with a mean difference of 1.97 points) and for distributing and collecting instructional material (a difference of 1.85 points). This would seem to suggest that aides may inflate their own importance, that teachers may downplay the role of aides or both.

That aides may see their role as somewhat more important than do teachers is also indicated by the fact than when aides were asked to name the activities which they consider as their greatest contribution to the Title I student they emphasized their direct dealings with students rather than their more mechanical, technical functions. They most often cited as their main contribution reinforcing learning by conducting drills or games with pupils and assisting pupils individually with learning tasks. The aides do feel, in any case, that their services are employed in such a way as to achieve maximum effectiveness (92.4% giving this response).

While only 11 aides both said that they were not being used most effectively and indicated how this situation might be corrected, their suggestions are instructive. Most of these aides said that in-grade, inservice training should be provided. This would necessitate spending more time in the classroom and less in activities which do not place the aide in direct contact with students. Aides also suggest that they serve the same group of students until these students master the particular skills the aide is trying to teach them and that a pay raise and a higher pay grade would improve morale and, as a result, effectiveness. Some said they wanted more of a role in curriculum planning for Title I students. Others suggested that the teacher's aide role relative to the teacher's role should be more clearly defined. This, they said, would produce better rapport between both teachers and aides and aides and students.

The aides also indicated how important they thought it was for an aide to possess various characteristics "in order to maximize her effectiveness." Twenty-four characteristics were listed, grouped into nine categories— categories such as "attitude toward the teacher aide position," "personal characteristics" and "skill in giving classroom assistance to children." Respondents could rate each listed characteristic as very important (scored 1), important, somewhat important or not significant (scored 4). Aides judged each characteristic as either "very important" or "important" except for having good rapport with other school personnel, which they considered only "somewhat important." In general the teacher aides produced the same pattern of responses here as the teachers themselves except that the aides were somewhat more likely than teachers to stress personal characteristics such as initiative and resourcefulness and somewhat less likely to stress specific mechanical skills.

We might, however, look more closely at the ratings made by the aides. Which characteristics did they consider most and least important— keeping in mind that virtually all were considered very important in an absolute sense? The five characteristics receiving the highest ratings are, in decreasing order of rated importance:

1. Accepts and shows understanding of child's attitudes and feelings;

2. Is knowledgeable of school procedures;

3. Is prompt and punctual in performing assigned duties;

4. Has a sense of personal and community pride, and

5. Is cooperative.

The five characteristics receiving the lowest ratings are, in increasing order of rated importance:

1. Communicates well with staff members (other than teachers);

2. Possesses knowledge of audiovisual equipment and operations;

3. Distributes, collects and inventories instructional materials and equipment;

4. Exhibits appropriate attitude toward community relations; and

5. Exhibits appropriate attitude toward school personnel other than teachers.

These results indicate that aides place most stress on their interaction with students and on general responsibility within the classroom. It is also interesting to note here that personal and community pride is also emphasized. Aides attribute least importance to interaction with school personnel other than teachers and with the community in general and also downplay the importance of specific skills such as those involved in handling audiovisual equipment.

TITLE I PRINCIPAL'S QUESTIONNAIRE

The methodology adopted for the polling of the principals for the 1976-77 evaluation of the District of Columbia Title I program was to mail individual questionnaires to principals during May 1977. The questionnaires were developed by National Testing Service and the Division of Research and Evaluation of the District of Columbia public schools. Eighty questionnaires with return envelopes were mailed by NTS during May 1977. The principals were asked to fill out the questionnaires and were assured in the cover letter that their replies would be held in the strictest confidence and that no information would be released concerning individual school data or principal data. None of the information was provided on an individual basis to either the Title I program or the District of Columbia Division of Research and Evaluation.

The rate of return on the questionnaire was good. By the end of June 1977, 33 schools had returned the questionnaires to NTS. Another four questionnaires were received by the Division during July and August; though the comments from these questionnaires are included in this chapter, the specific responses to questions 1 through 7 were not.

Of the returned questionnaires, 29 were from elementary schools, and four were from junior high schools. The junior high questionnaires were not filled out as carefully as those from the elementary schools, so the data on the junior high schools should be viewed with some caution.

The principals were asked to explain their understandings of the present selection procedures for student participation in the Title I program. The majority indicated that the main criterion for selection of participants was based on a number of factors. The most common factor indicated was that student selection is based on the results of standardized testing conducted by the District of Columbia. The majority of the principals indicated that students below the 50 percentile were to be[9.1] served first.

The second criterion that principals mentioned as a selection factor was teacher recommendations in concert with principal and counselor recommendations based on the study of a student's school record test results. Also mentioned was that counselors in some schools administer their own criterion-referenced tests to determine student eligibility for the program. Also mentioned as criteria for participation in the Title I program were the following:

1. Income;
2. Student participation in the free lunch program, and
3. Student retention record.

It should be noted that eligibility for the program in the various schools does not mean that the student will be served by the Title I program.

The next question that the prinicipals responded to was:"Did they feel that the present criteria for student selection for Title I participation were adequate?" The majority indicated that the criteria were adequate. A small number indicated that the criteria were not adequate. The main emphasis concerning the inadequacy was that the criteria should be liberalized or extended to include more students.

The other recommendation for changing the criteria was that the principal be given more leeway in interpreting the criteria for selection to allow him to apply the criteria more liberally and to insure that more students could participate in the program. Another suggestion put forth by several principals was that the present cutoff figure of 50% on a nationally normed test be eliminated and that the criteria for selection be totally within the school and within the purview of the principal and teachers serving the students. One principal suggested that the eligibility test for kindergarten students should be on the kindergarten, not on the first grade, level.

In reply to the question "What kinds of assistances/services do you presently receive from the Title I office?" , the principals listed the following:

1. Teacher aides,
2. Reading resource teachers,
3. Math resource teachers,
4. Pupil-personnel workers,
5. Parent assistants,
6. Program assistants,
7. Clothing and cultural enrichment for the students.
8. Transport, and
9. Workshops for the classroom teachers and specialists in reading and math.

In response to the question, "Would you like to see the services expanded?" a majority of principals indicated that they would not and that they felt that the services were adequate. The principals who did indicate that they would like to have these services expanded suggested that regional contacts by Title I staff should be made with all Title I schools. They also suggested that they would like to see the services of the parent assistants remain on the secondary as well as the elementary level. They requested that they have available regularly a psychologist and that their pupil-personnel workers come to school regularly. Principals also requested more inservice training for Title I staff, classroom teachers, educational aides, program assistants, and parents. Several of the principals requested a full-time health aide. In summing up the principals' responses, it would seem that the principals would like to see the Title I services expanded.

In response to the question "What kinds of activities presently occur in your school to encourage parent participation under the Title I program?" the principals replied as follows. They indicated that they were conducting parent advisory council meetings and that at these meetings door prizes were passed out to encourage participation. Title I personnel were being invited to these meetings and workshops to make the meetings more meaningful to the parents. The principals also indicated that they had a parent volunteer program within their schools, that the PTA within their schools actively recruited parents, and that the counselor and the pupil-personnel workers actively encourage involvement within the schools. Principals also indicated that they were conducting workshops for parents several times during the year, that parent meetings were being conducted at least once a month, and that a bulletin board was available to the parents. The principals indicated that they have active commitment to encouraging parent participation in the Title I program.

Responses were sought to the question "How many and what kind of other education programs (state, local or Federal) do you have ongoing in your school at this time? Please list." The principals listed a constellation of programs. Some of these were:

1. The regular school program,
2. The special educational learning centers,
3. The special educational kindergarten,
4. Project impact,
5. Diagnostic instruments for the teachers,
6. Widening horizons,
7. Learning centers, and
8. Response to educational needs programs.

Other supplementary or additional educational programs listed by the principals were:

1. The CSSP program (Collaborative Saturated Services Program),
2. DISTAR program,
3. STELLAR program,
4. The Garden Club,
5. The Rovin-Leader program,
6. Community school program,
7. NEEDS project,
8. Model preschool, and
9. Lunch program.

In response to the question, "How do the results to the present Title I achievement testing program get back to your school?" the majority of principals indicated that the results get back by mail. Some principals also indicated that the present method for getting the results back to the school was inadequate. They would rather have the school counselor or someone within the school pick up the test results or have the test results be delivered to the schools by the Regional Coordinator.

In response to the question "How are the results, if received, used in your school? Please explain," the majority of principals indicated that the achievement results that they received from the Title I office are reviewed in the following manner. The principal and teachers review the results and make a list of students who are eligible for Title I services. Some schools indicated that the results are published to the teachers of the students; other schools indicated that the school counselor works out an individual instructional program for the students based on the results of standardized testing; still others indicated that test results determine who gets first priority to be scheduled for the math or reading resource teachers as well as who will work with the educational aides assigned to their classes. Principals also indicated that test results are used as either an evaluation document in the special education program or as a source document in diagnostic prescriptive teaching. The consensus, however, among the principals was that the results of the standardized testing are used as a primary selection tool for participation in the Title I program. The methodologies that the principals described in using the results would indicate that they are cognizant of the shortcomings of standardized testing.

PARENTAL INVOLVEMENT

The original legislation which set up Title I made essentially no provisions for the inclusion of a parental involvement component of the program. The Commissioner of Education in Program Guide 36 (April 1967), required that appropriate activities or services in which parents will be involved be made a part of the Title I program. Within a year, in Program Guide 44 (March 1968), the guidelines were clarified to indicate that parents and other groups must be consulted by local educational agencies (LEA's) in the planning process. The shortcoming with both of these guidelines is the lack of specific language which would indicate how this mandate should be carried out. This problem became much more severe as different school systems implemented Title I and its parental guidelines.

In July 1968, Program Guides 46 and 46a suggested that LEA's establish Parent Advisory Councils (PAC's) for Title I programs. Within four months, in November 1968, the regulations were again changed, requiring maximum practical involvement of parents in all phases of Title I. In 1970, Public Law 91-230 gave the Commissioner of Education the power to require parental involvement for any Federally financed program which he felt might benefit from such participation. In October 1971, the parental involvement component of Title I became a requirement for any Title I program. Then, in August 1974, Public Law 93-380 provided that PAC's be required for each district and each school served by the program. Membership was to be selected by parents, and the majority of people on these councils were to be parents of Title I children in the Title I schools. As can be seen from the brief foregoing synopsis, the guidelines for the Title I parental involvement component have evolved rather slowly over the years of the program. The programs, as they now exist, are the result of Federal law, and, as such, have similarities from LEA to LEA. The Title I Parent Involvement Component was established in the District of Columbia in October, 1971.

PARENTAL INVOLVEMENT COMPONENT OF THE DISTRICT OF COLUMBIA TITLE I EVALUATION FOR THE 1976-77 SCHOOL YEAR

The results of the design conference held for the construction of the parental involvement component evaluation design indicated that an objectives-based evaluation be conducted for the 1976-77 school year. The parents in attendance at the meeting, held during March 1977, requested that the project or program component be evaluated based on whether the objectives as stated for that component had been met. The program objectives for the 1976-77 school year were divided componentially.

Program Objective I

The objectives for the parent advisory councils for the 1976-77 school year were:

1. By October 31, 1976, the school intermediate district PAC's will be organized and officers and delegates will be nominated and selected.
2. By May 30, 1977, school intermediate district PAC's will conduct regularly scheduled meetings to make official recommendations regarding the operation of the Title I program.

Program Objective II

The objectives for the parent assistants for the 1976-77 school year were:

1. By October 31, 1976, part-time assistants will be assigned to Title I schools on the basis of the number of Title I identified children;
2. By May 30, 1977, part-time parent assistants will receive intensive training through a variety of staff development activities.

Program Objective III

The objectives for the parent voluntary corps for the 1976-77 school year were:

1. By October 31, 1976, approximately 400 parents will support the instructional program by giving volunteer services in Title I schools;
2. By April 30, 1977, at least 15% of the Title I parents will participate in staff development and training activities.

National Testing Service (NTS) designed and printed an objectives-based checklist for the Title I parental involvement component. This checklist featured the designation of the person responsible within every Title I school for each of the previously listed objectives and the date by which the objectives should have been completed. There was room on the form for indicating the actual date of com-

pletion and for other marks, if they were appropriate, for that specific component. The objectives checklist was filled out by the Title I Parental Involvement Coordinators' Office and provided to NTS upon completion. Results are presented in Table 9.2.

TABLE 9.2

PARENTAL INVOLVEMENT OBJECTIVES
COMPLETION IN MONTHS

OBJECTIVES	TIME OF COMPLETION
1.1	2 months late
1.2	6 months early
2.1	2 months early
2.2	On time
3.1	1 month early
3.2	On time

The other methodology adopted for evaluating the parental involvement component was to develop a series of questionnaires, which were to be given to parents during the remaining school year, to solicit their input regarding certain programmatic components and strategies as they were implemented in the program during the 1976-77 school year. Two questionnaires were developed and used in the evaluation. The first of these was the District of Columbia Public School Title I Parent Survey, and the second was The Parent Awareness Conference Questionnaire. Both of these instruments were distributed at the Parent Awareness Conference during the spring of 1977. The return rate on the questionnaires was not as good as might have been expected; however, the reason for the low rate of return was more a problem of how the instruments were distributed than of parent interest or Title I staff support. The questionnaires were distributed to the parents at a separate table at the entrance to the location of the Parent Involvement Conference and were not made a part of the packet of materials that the parents received. It is the contention of NTS that the rate of return would have been higher had the questionnaires been made a part of the conference materials.

Of the 176 parents who responded to the questionnaire, 117 had a child in the Title I program and 59 did not. The majority of parents learned of the conference through the school and regional PAC or through participation in a planning committee. Both Title I parents and non-Title I parents learned of the existence of the conference through the bulletin board or by word of mouth from a teacher, principal, or another Title I parent. The majority of both Title I and non-Title I parents had attended last year's conference, and a majority of the ones that had attended last year's conference participated in this year's planning and development.

As part of the instrumentation, parents were asked whether the workshops they had attended were informative or noninformative. They were asked to give their impressions of 13 workshops. There was a clear consensus among the parents who attended the workshops that the majority were informative. Very few parents described any of the workshops as noninformative for their purposes. The workshops that received the largest audiences dealt with: (1) "The Cultural Routes in Music;" (2) "The Magic of Math;" (3) "There Is No Use for Child Abuse;" (4) "Window On The World Through Reading and Language Arts;" and (5) "Home, the Learning Place," a Trinity College presentation. There was no difference between the perceptions of the parent withor without a Title child in regard to which of the workshops were most interesting.

Parents were also asked for comments on two questions that were on the instruments. The first of the questions was "What other kinds of workshops would you like included next year?" In response,

parents requested workshops concerning the methodology for increasing the self-awareness of children, encouraging the physical education of children at home, and enhancing the involvement of the principal in Title I affairs. Several requests were made for workshops that would be taught and supervised by the Title I parents. Members of the Title I staff or outside people would only be present as spectators. Several people requested that the same workshops that had been held this year be held again next year. Many requests were made for workshops to help parents increase their effectiveness in public speaking, reading, or mathematics. Conferences concerning improving student discipline both in the home and in the schools were discussed. Several people were concerned with training in parent effectiveness and how to improve their interpersonal relationships both with their children and other members of the parent advisory group. Some parents requested that workshops be conducted concerning the competency-based curriculum. It should be pointed out, however, that in the cases where parents did take the option to respond to this first question, a large number expressed their satisfaction with the content and range of workshops conducted, and requested that the good work be continued.

The second open-ended question was "What other kinds of suggestions and comments do you have regarding the parent conference?" The major concern that parents expressed in their answers to this question was that the location for the parent awareness conference be changed to facilities which would accommodate a large number of parents. Increased size of the meeting place could facilitate the attendance by parents at the workshops. Also, easier access to those quarters could improve parent turnout. Several parents made comments to the effect that they could not attend workshops that were located far from their homes. Some potential participants just could not find the presentation rooms because of the numbering system. For others, the directions that they were given were incomplete and did not allow them to find the proper site. The consistent feeling of the parents regarding the physical facilities of the conference was that they had seen the parent awareness conference group increase in size and attendance every year and that it was time to move the location so that more could be accommodated.

The second concern that most parents had was with the specific methodology used in registration. The method that was used during the 1976-77 school year was slow, tedious, and confusing. Several parents suggested that a new methodology be adopted for registration at the conference. Another involved sending the materials to the parents at their home address so that they would have the materials and could then be better prepared to participate in the conference. The parents also requested that the listings of the workshops which were to be held on the first and second days have much more detailed information. Thus, the contents of the workshops and the specific objectives that they were intended to achieve would be clear and available to participants.

Parents were also concerned that news concerning the conference be disseminated a little earlier in the year to allow parents to allocate time to attend. Several parents commented that the organization of the food service could have been a little better. The planners of the conference should have anticipated more closely the actual number of people that would attend. Several other persons responding to the questionnaire indicated that they thought that many of the people who attended the first luncheon were not registered and were not involved Title I parents or PAC members. Several parents suggested that the music that was played be changed for the 1977-78 conference and that, of the conferences they had attended, the music was consistently the same and should be changed. One parent's suggestions were that the conference should not be reassembled but that the money saved should be used for parent-partner and parent assistance.

The great majority of parents who elected to respond to this open-ended questionnaire indicated that they were very satisfied with the content and operation of the parent conference. They thought that it was informative and well organized and that anything else to be done in regards to this conference would only improve the existent good product. The second questionnaire, used as an evaluation instrument for the Parental Involvement Component in the District of Columbia Title I schools, was the District of Columbia Public Schools Title I Parent Survey. This survey was a part of the package that was distributed during the parent Awareness Conference. A total of 171 parents elected to respond to this questionnaire. Of these, 114 were Title I parents and 57 were non-Title I

parents. In part I of the questionnaire, parents were asked to indicate which activities they thought were important in helping a child succeed in school. They were asked to circle important or nonimportant in relation to possible helpful choices.

The results of this questionnaire are presented in Table 9.3. It can be seen that most of the Title I parents and the non-Title I parents thought that all the listed activities were important to the progress of the Title I child. The only exception to this is that 59 percent of the non-Title I adults did not think that parents should make curriculum decisions for their children's schools. All in all, the results of this part of the questionnaire indicate that the Title I parents and non-Title I parents are very cognizant of the types of activities that they can undertake to insure the successful completion of the school experience for their children.

TABLE 9.3: PARENT POSITIVE RESPONSES TO PARENT AWARENESS CONFERENCE QUESTIONNAIRE REGARDING IMPORTANCE OF CERTAIN ACTIVITIES

		TITLE I		NON-TITLE I	
		%	N	%	N
1.	Parents working with small groups of children in the classroom	94	107	87	50
2.	Parental workshops in math and reading for parents	96	110	89	51
3.	Parents visiting children's classrooms	95	109	82	47
4.	Parents asking children about their school work	99	113	85	49
5.	Working on parent committees	85	97	80	46
6.	Parents preparing creative materials for children to use in the classroom	80	112	87	50
7.	Parents reading to their children	98	112	87	50
8.	Teacher-parent conferences	97	111	87	49
9.	Child nutrition training sessions for parents	85	98	73	42
10.	Parents assisting their children with their school homework	97	111	87	50
11.	Parents attending and participating in council meetings	90	103	80	46
12.	Parents making curriculum decisions for their school	83	95	59	34
13.	Parents assisting on field trips	92	105	85	49

In Part 2 of the parent survey, parents were asked to respond to 11 questions either with "yes," "no," or "don't know." Presented in Table 9.4, the results of this part of the questionnaire are generally positive both for Title I and non-Title I parents. The major exceptions to this are question 7--"Has the school told you of any health problems your child has had this year?" and question 8--"Did the school help you find a doctor, dentist, or other medical help?" Both Title I and non-Title I parents indicated that the school did not provide the assistance that they thought they were due in this regard during the 1976-77 school year. Nineteen of the parents responding to question 1 indicated that they did not know whether or not their children felt better about themselves since enrollment in the Title I program. This finding is not surprising in view of the fact that several parents requested that one of the workshops to be conducted for the 1977-78 Parent Awareness Conference be concerned with how to help children increase their self-awareness and how to measure that self-awareness as a parent. This would indicate that there is consistency across both questionnaires in terms of parent responses.

Table 9.4: Title I Parent Responses on Title I Questionnaire in Absolute Numbers Regarding Operation of Title I Program

	Title I	
	Yes	No
1. Does your child feel better about himself since enrollment in the Title I program?	61	3
2. Because of the Title I program, do you think your child has a better understanding of why he (she) should attend school?	70	5
3. Is your child getting special help in reading?	52	27
4. Has your child's reading level improved since he has been in the Title I program.	70	7
5. Is your child getting special help in mathematics?	44	33
6. Has your child's arithmetic improved since he has been in the Title I program?	65	7
7. Has the school told you of any health problems your child had this year?	23	54
8. Did the school help you find a doctor, dentist, or other medical help?	23	52
9. Should parents help the school in choosing programs of this kind for their children?	73	3
10. Does the Title I program keep you advised of your child's academic programs?	66	14
11. Are you satisfied with the help that your child is receiving from the Title I program?	76	4

As can be seen from a listing of the objectives of the Parental Involvement Component, they are concerned strictly with formal parental involvement in the PAC. Little is noticed in the objectives and the goals concerning the role in the school of parents as parents. The concern is with the mechanics and methodologies employed to insure that a PAC is established on time, in conformance with the mandates of the public law.

At any one time, the maximum number of parents in attendance at the Parent Awareness Conference was from 800 to 1,200. This did not represent more than approximately 5% of the total population of available Title I parents. A note to be made in this regard is that had all the parents that could have attended done so, the facilities that would have been available for those parents would have been woefully inadequate.

It is the view of this observer, having attended the Parent Awareness Conference for the 1976-77 school year, that more parents should have been involved as both presenters and organizers. While the meeting was useful, as seen by parental comments and reported perceptions of the conference on the instrumentation provided, it might also be useful to have the parents conduct more of the in-service activities for other parents. Larger facilities should be made available to the parents during the 1977-78 school year; this would enable a greater number of parents to attend and would allow those parents who do attend to move in an expeditious manner from workshop to workshop.

THE TITLE I RESOURCE TEACHER

The Title I resource teachers serve as Title I curriculum leaders for reading, language arts and mathematics at their particular schools. They provide services to all Title I children identified for assistance in reading and mathematics and to all classroom teachers of identified students as well as to many other members of the school team.

Schools with identified populations of 150 or fewer students have one combination resource teacher who provides both reading and mathematics assistance to students. Those schools with 151 to 300 students have one reading and one mathematics resource teacher. Those with 301 to 450 students have three resource teachers, while schools with 451 and more have two reading and two mathematics resource teachers.

A resource teacher functions in three distinct yet related areas of responsibility. The first of these involves provision of direct instructional service for identified Title I students. The second area of responsibility includes assistance to classroom teachers of identified Title I students. The third involves staff development and leadership at the building level for teachers of identified Title I students. In general, the resource teacher provides service to Title I identified students, educational aides, parent assistants, classroom teachers of Title I students, and pupils and members of the pupil personnel team.

The Title I resource teacher provides services to the classroom teacher in her resource laboratory. Among these services are the introduction of new learnings, motivation of students, diagnosis of specific learning problems, prescription of specific strategies to meet those problems, implementation of teaching strategies within her classroom, tests for mastery and for achievement, provision of independent learning activities and simulation games, and conduct of field extension activities. For the most part, direct instruction is provided to small groups of eight to ten Title I identified students within her classroom laboratory, while supervision of the instruction process is provided with larger groups of identified Title I students (up to 25), again in the laboratory.

In addition to placement of resource teachers in the elementary grades, the Title I program has a resource teacher at the junior high, or seventh grade, level. The Title I junior high resource teacher, either a reading or mathematics teacher (one per school), provides essentially the same services to the seventh graders as those provided by the elementary grade resource teacher. These include instructional services to identified Title I students provided for a designated number of periods per week during the semester in a self-contained learning center.

In order to assess the impact of the role of the Title I resource teacher and to further define her functions within the school, National Testing Service, in conjunction with the members of the Title I staff and members evaluation office of the District of Columbia Public Schools, convened a design conference in the early spring of 1977. At this conference, the instrumentation that was subsequently used in the evaluation was designed and approved. A total of 240 instruments was sent out to the various schools as part of the teacher process assessment package. Of those 240 questionnaires, 70 were subsequently returned to National Testing Service. The data were reduced during June 1977, and an initial analysis was performed during July and August 1977.

The instrumentation consisted of four parts. The first of these specifically solicited input from reading teachers or Title I combination teachers. Part two of the questionnaire solicited input from mathematics or combination teachers. Parts three and four solicited input from all resource teachers and included open-ended questions which all resource teachers were asked to respond to. (These data are reported later in this chapter.)

In general, information reported by respondents to the questionnaire included the following. The Title I resource teachers reported that the average number of Title I students on the reading list was 140.64. The average number of Title I students on the mathematics list was 152.54, while the average number of Title I students on the combined list was 200.10. The Title I resource teachers also reported that the average number of students that they served per day was 50.

As shown in Table 9.5, the Title I reading resource and combination teachers reported that their students were having difficulties in listening comprehension, lacked interest in reading independently, and experienced difficulties with word meanings, with reading comprehension, in using phonetic analysis and decoding words, in using structural analysis and decoded words, in using content clues and decoding words, in using study skills, and in communication through the written language. On the other hand, the teachers surveyed reported that the students did not have difficulties in communicating orally with their peers, in communicating orally with the teacher, or in using picture clues and decoding words. These responses suggest that Title I resource teachers view the Title I students they serve as having difficulty in dealing with the abstract nature of reading, but that ability to communicate orally and to input information orally does not seem to be affected at all.

TABLE 9.5: READING AND COMBINATION RESOURCE TEACHER RESPONSES, IN PERCENT TO THE QUESTION "DO THE MAJORITY OF THE CHILDREN WHOM YOU SERVE DISPLAY"

(N = 42)

		YES	NO
1.	Difficulties in listening comprehension	90.7	9.3
2.	Difficulties in communicating orally with their peers?	19.0	81.0
3.	Difficulties in communicating orally with you, the teacher?	37.5	62.5
4.	Seeming lack of interest in reading independently?	81.4	18.6
5.	Difficulties with word meanings?	92.7	7.3
6.	Reading comprehension difficulties?	97.6	2.4
7.	Difficulties using phonetic analysis in decoding words?	93.0	7.0
8.	Difficulties using structural analysis in decoding words?	93.0	7.0
9.	Difficulties in using picture clues in decoding words?	37.2	62.8
10.	Difficulties in using content clues in decoding words?	90.5	9.5
11.	Difficulties using study skills?	97.7	2.3
12.	Difficulties in communicating through written language?	61.4	39.6

TABLE 9.6: READING AND COMBINATION RESOURCE TEACHER RESPONSE IN PERCENT TO THE QUESTION: "AT WHICH GRADE LEVEL IS THE PROBLEM GREATEST"

(N= 42)

		Grades		
		1	2	3
1.	Difficulties in listening comprehension?	25.0	3.6	25.0
2.	Difficulties in communicating orally with their peers?	16.7	8.3	16.7
3.	Difficulties in communicating orally with you, the teacher?	26.7	6.7	26.7
4.	Seeming lack of interest in reading independently?	13.0	17.4	39.1
5.	Difficulties with word meanings?	21.4	10.7	32.1
6.	Reading comprehension difficulties?	10.0	13.3	36.7
7.	Difficulties using phonetic analysis in decoding words?	17.2	17.2	20.7
8.	Difficulties using structural analysis in decoding words?	13.8	6.9	41.4
9.	Difficulties in using picture clues in decoding words?	38.9	11.1	5.6
10.	Difficulties in using content clues in decoding words?	3.8	15.4	42.3
11.	Difficulties using study skills?	3.6	3.6	60.7
12.	Difficulties in communicating through written language?	3.3	10.0	40.0

Table 9.6 shows the results of the resource teacher questionnaire regarding the grade level in which these problems seem to be the greatest. As indicated in this table, the responding teachers report that most of the problems they have in these areas seem to occur in the third grade, with the exception of difficulties in using picture clues and decoding words. The main problem in that area seems to occur in the first grade, with the third grade at a low of 5.6% of teachers reporting difficulties at that grade level.

Title I mathematics teachers and Title I combination teachers were asked to respond to Part II of the questionnaire. In this part questions dealt with the problems teachers were having in specific grade levels concerning mathematics. Table 9.7 indicates that Title I mathematics resources teachers reported that their students had difficulties with: the concept of numbers, in ordering numbers to 100, with the counting of money, with whole number addition, with whole number subtraction, with whole number repetitive subtraction, with whole number repetitive addition (though less than with subtraction). with measurement, with skill in problem solving, and in the application of mathematical skills to problems of practical situations. They lacked interest in using mathematical concepts and processes, lacked interest in using metrication concepts and processes, and had difficulties in telling time. Conversely, these teachers reported that their students had less difficulty with ordering numbers to ten and little difficulty with geometric concepts. The pattern again appears to be that teachers reported their students to have a difficult time with abstract processes or requirements but less difficulty with mathematical operations they can perform as manipulatives and deal with orally rather than in an abstract manner.

Table 9.8 indicates teacher responses to the question of greatest difficulty with the particular concepts in question by grade level. As shown in this table, teachers indicate that the first grade level students have difficulty in ordering numbers to ten. This finding might have been expected. Further, the pattern seems to repeat that the greatest difficulty teachers have seems to lie at the third grade level.

Part III of the questionnaire was completed by all Title I resource teachers. Table 9.9, which presents the results of this part of the questionnaire, indicates that Title I resource teachers perceived their students to have problems related to self-concept, difficulties in completing independent assignments, lack of background information and experiences needed to understand and use concepts taught in school, short attention spans, and aggressive behavior, all of which are characteristics that tend to interfere with learning.

Conversely, teachers reported that their students had fewer difficulties with peer relationships, almost no difficulties in relating to the teacher, some difficulties in working with younger children, fewer difficulties in working with peers, fewer difficulties in working with older children, and few health difficulties that interfered with their learning. Also, they did not exhibit withdrawn behavior. The teachers also reported that irregular absentee rates in their classes were not a problem.

Table 9.10, which shows the teacher responses concerning the greatest difficulty in the particular activity under question by grade level, indicates that first graders were having more difficulty than second and third graders with short attention spans and withdrawn behavior. It also indicates that third graders were having more difficulty than first and second graders with aggressive behavior, with working with younger children, and in relating to the teacher as an adult.

All resource teachers were requested to fill out Part IV Table 9.11 of the resource teacher questionnaire. Resource teachers were asked to indicate what kinds of teaching approaches, i.e., what kinds of media, techniques, and tools, they used in their resource lab to facilitate the learning of the Title I child. Most respondents indicated use of groupings based on skill needs, interest groupings based on skill needs, and groupings based on grade level. They used film strips, overhead transparencies, tape recorders, art paper, crayons, and paints; paper and pencil activities; extensive psychomotor activities; manipulatives; dramatic play; and teacher-made devices. Resource teachers reported that they are less likely to use homogeneous groupings based on age, or groupings based on sex.

Ninety-one percent of the teachers responding to the questionnaire indicated that they had no problems setting up groups as instructional methodologies. The groups that they did set up were structured in the following ways: 86.7% structured their groups according to skills, 11.7% structured their groups according to class, and 1.7% according to age. No teachers reported use of ability groupings or small task groupings.

Another area of response involved length of experience in the Title I program. Most of the Title I resource teachers in the District of Columbia reported that they had at least two years of experience in their present position, with 22.1% reporting at least five years in their present position, 17.6% reporting at least four years in their present position, and 14.7% reporting at least three years in their present position. Most of the teachers also reported that they had at least two years at their present position in their present school, with 20.3% reporting at least one year, 15.6% reporting at least three years, and 17.2% reporting at least five years at their present school. Finally, 80.7% of respondents indicated that they were certified resource teachers with 13.5% indicating that they were not certified as resource teachers and 8.6% failing to respond to this part of the questionnaire.

The Title I resource teachers were asked to respond to three open-ended questions on the Title I resource teacher questionnaire. What follows is a representative listing of the remarks that some of the teachers provided as responses to these open-ended questions. These remarks should not be viewed as representative of the resource teachers as a whole but should be viewed as representative of those resource teachers who chose to respond to the questionnaire in this form. To the question of what teaching strategies the students react to most favorably, the representative remarks are as follows:

- "Blackboard and concrete presentation, individual manipulatives, and psychomotor involvement";
- "use of audiovisual equipment, use of dramatic play, use of active games, use of grouping by skills, use of manipulatives";
- "High use of manipulatives";
- "use of picture clues to develop sight vocabulary";
- "use of concrete objects, use of semi-concrete objects";
- "Dramatization, use of visual and auditory techniques."

Also representative of teacher responses to this question are the following:

"Small group activities, learning station ties, being read to, reading aloud, games, and manipulatives."

"Manipulatives that teach a skill, one-to-one individualized instruction, small group instruction."

"Teacher-made tasks, interviews, learning packages, directed reading, self-choice. A diagnostic instructional program. Attention to the improvement and extension of vocabulary and word recognition skills through games, picture study, listening to stories, looking at films, listening to tapes, recording and using puppets and games."

The resource teachers were also asked to respond to a question concerning how they establish and maintain good working relationships with the classroom teacher. The following is representative of some of their replies: "To be a friendly, cooperative professional performing my expected role effectively and efficiently." "I keep the lines of communication open with frequent program reports on the students with which I am working." "I explain to the teachers what I am trying to accomplish, I send notes to them concerning the children. I visit them at their convenience and always allow them time to speak freely; I have monthly sheets for them to list skills that they feel are needed for the children to master." "Displaying good human relations, the use of conferences to discuss needs and progress relating to Title I student activities." "Individual conferences to discuss specific information concerning pupil needs and their progress." "Correlate the skills needs of pupils with the suggestions from classroom teachers; maintain professional relationships and accept change and suggestions from classroom teachers if they can be used to improve the program."

The main strategy resource teachers reported using for the establishment and maintenance of good communication between themselves and the classroom teacher was provision of feedback to the

classroom teacher and soliciting of feedback from the classroom teacher concerning the progress of individual students or groups of students the resource teacher was working with. The emphasis in their replies seems to be that good working relationships with the classroom teacher can be maintained through reliance on human relations skills. The feelings that most of the resource teachers conveyed concerning this question was that they view the link between the classroom teacher and the lab resource teacher as critical to the success of the program. They also indicated a desire for more communication among the faculty concerning the role of the resource teacher and how that role interfaces with the other aspects of the activities within the school. Several resource teachers requested that meetings be convened at regular intervals to allow for interpersonal communication between the regular faculty and the Title I faculty and the administration within the school. The emphasis of the Title I resource teachers in reply to this question seems to be that the principal or the administration within a school can best support the Title I effort within the school and specifically the resource laboratory by managing time, materials, and personnel in order to achieve optimal implementation and operation of the Title I program within that school.

FOOTNOTES

[9.1] Perhaps this explains the discrepancy in test results; while principals think that test performance is the first criterion, other criteria are being applied first.

TABLE 9.7: MATHEMATICS OR COMBINATION RESOURCE TEACHER RESPONSES IN PERCENT TO THE QUESTION: "DO THE MAJORITY OF THE CHILDREN WHOM YOU SERVE DISPLAY"

(N = 42)

		YES	NO
1.	Difficulties with the concept of numbers?	62.5	37.5
2.	Difficulties with ordering numbers to 10?	33.3	66.7
3.	Difficulties with ordering numbers to 100?	77.5	22.5
4.	Difficulties with the counting of money?	64.3	35.7
5.	Difficulties with whole number addition?	64.3	35.7
6.	Difficulties with whole number subtraction?	83.3	16.7
7.	Difficulties with whole number reptitive subtraction?	94.9	5.1
8.	Difficulties with whole number repetitive addition?	75.7	24.3
9.	Difficulties with measurement?	83.3	16.7
10.	Difficulties with geometric concepts?	43.6	56.4
11.	Lack of skill in problem-solving?	60.0	40.0
12.	Difficulties with application of mathematics skills to practical situations?	90.5	9.5
13.	Lack of interest in using mathematics concepts and processes?	60.0	40.0
14.	Lack of interest in using metrication concepts and processes?	62.9	37.1
15.	Difficulties with telling time?	71.4	28.6

TABLE 9.8: MATHEMATICS OR COMBINATION RESOURCE TEACHER RESPONSES IN PERCENT TO THE QUESTION "DO THE MAJORITY OF THE CHILDREN WHOM YOU SERVE DISPLAY"

(N = 42)

	Grade		
	1	2	3
1. Difficulties with the concept of numbers?	28.6	9.5	0
2. Difficulties with ordering numbers to 10?	40.0	0	0
3. Difficulties with ordering numbers to 100?	20.0	28.0	8.0
4. Difficulties with the counting of money?	21.1	15.8	10.5
5. Difficulties with whole number addition?	30.0	15.0	20.0
6. Difficulties with whole number subtraction?	20.8	12.5	20.8
7. Difficulties with whole number repetitive subtraction?	12.0	20.0	32.0
8. Difficulties with whole number repetitive addition?	15.8	15.8	26.3
9. Difficulties with measurement?	4.5	13.6	27.3
10. Difficulties with geometric concepts?	7.7	15.4	15.4
11. Lack of skill in problem-solving?	3.6	7.1	25.0
12. Difficulties with application of mathematic skills to practical situations?	3.7	7.4	33.3
13. Lack of interest in using mathematics concepts and processes?	0	11.1	33.3
14. Lack of interest in using metrication concepts and processes?	0	0	21.4
15. Difficulties with telling time?	17.4	13.0	21.7

TABLE 9.9: ALL RESOURCE TEACHER RESPONSES TO THE QUESTION: "DO THE MAJORITY OF THE CHILDREN WHOM YOU SERVE DISPLAY"

(N = 70)

		YES	NO
1.	Difficulties related to self-concept?	58.6	41.4
2.	Difficulties with peer relationships?	29.7	60.3
3.	Difficulties relating with you, as an adult?	11.4	88.6
4.	Difficulties completing independent assignments?	89.9	10.1
5.	Lack of background information and experiences needed to understand and use concepts taught in school?	87.0	13.0
6.	Difficulties in working with younger children?	15.2	84.8
7.	Difficulties in working with peers?	44.3	55.7
8.	Difficulties in working with older children?	18.8	81.2
9.	Health difficulties that interfere with learning?	16.2	83.8
10.	Health difficulties that do not interfere with learning?	17.5	82.5
11.	Short attention spans?	91.4	8.6
12.	Withdrawn behavior characteristics that interfere with learning?	37.1	62.9
13.	Aggressive behavior characteristics that interfere with learning?	62.9	37.1
14.	Irregular absentee rates in your classes?	43.5	56.5

TABLE 9.10: ALL RESOURCE TEACHER RESPONSES IN PERCENT TO THE QUESTION: "AT WHICH GRADE LEVEL IS THE PROBLEM GREATEST"

(N = 42)

		Grade 1	2	3
1.	Difficulties related to self-concept?	12.5	6.3	31.3
2.	Difficulties with peer relationships?	7.7	7.7	34.6
3.	Difficulties relating with you, as an adult?	9.1	0	36.4
4.	Difficulties completing independent assignments?	26.3	9.8	12.2
5.	Lack of background information and experiences needed to understand and use concepts taught in school?			
6.	Difficulties in working with younger children?	7.7	0	38.5
7.	Difficulties in working with peers?	8.0	8.0	40.0
8.	Difficulties in working with older children?	25.0	0	25.0
9.	Health difficulties that interfere with learning?	0	20.0	10.0
10.	Health difficulties that do not interfere with learning?	0	12.5	0
11.	Short attention spans?	35.6	2.2	0
12.	Withdrawn behavior characteristics that interfere with learning?	33.3	4.2	8.3
13.	Aggressive behavior characteristics that interfere with learning?	3.1	6.3	46.9
14.	Irregular absentee rates in your classes?	15.4	11.5	11.5

TABLE 9.11: RESOURCE TEACHERS' INDICATION OF TEACHING APPROACH, MEDIUM, TECHNIQUES OR TOOL USED IN TITLE I RESOURCE LAB

(N = 42)

		USE
1.	Grouping based on skill needs.	91.0
2.	Interest grouping based on skill needs.	87.0
3.	Grouping based on age.	33.0
4.	Hemogeneous grouping based on age.	25.0
5.	Grouping based on grade level.	85.4
6.	Heterogeneous grouping based on grade level.	75.7
7.	Grouping based on sex.	10.5
8.	Use of films.	88.2
9.	Use of filmstrips and slides.	88.7
10.	Use of transparencies and overhead projectors.	82.7
11.	Use of tapes and records.	88.7
12.	Use of art paper, crayons, paints.	88.0
13.	Use of paper-and-pencil activities.	91.2
14.	Use of Psychomotor activities.	86.9
15.	Use of manipulatives.	90.0
16.	Use of dramatic play, role playing.	89.2
17.	Use of teacher-made devices.	90.0
18.	Individualized learning activities.	89.6
19.	Learning station activities.	87.9
20.	Programmed instructional activities.	84.1
21.	Whole-group teacher directed activities.	87.5
22.	Allowing for student/teacher personal interaction.	89.4
23.	Small group activities.	89.1
24.	Independent activities.	90.5
25.	Making up problems.	90.7
26.	Reading stories to class.	88.7
27.	Sustained silent reading.	87.7
28.	Students composing stories which they write or teacher takes down.	88.0

CHAPTER X
SPECIAL EDUCATION

The District of Columbia Public Schools have established the goal of providing full educational opportunities to all children, regardless of the nature or degree of the handicapping conditions. This emphasis has made it impossible to continue to justify the massive and sometimes arbitrary isolation from the regular educational setting of students who have intellectual handicaps, or who are impeded in their growth and development by either temporary or permanent psychological, physical, or sociological factors. In congruence with the established goal of the District of Columbia Public Schools, in this regard, the Washington, D. C., Title I program has established the noncategorical learning center program, which concentrates on the conditions and factors that will increase the specialized efficacy of public instruction. This will allow children with special needs to remain in the educational mainstream.

The Title I learning center program holds, as its ultimate goal, the soonest possible return of the child to the mainstream of education on a full-time basis.

Population Served

The served population of the Title I special education learning centers was comprised of students from the selected elementary schools whose needs could not be met at the local school level. For the 1976-77 school year, 204 students received direct instructional programming in four learning centers. Of these, 34 were identified students placed in the program through special education placement, 66 were tutorial students, and 31 were transient tutorial students. It can be seen from the makeup of the population of the student cohort that most of the students were tutorial or transient tutorial with only 34 being placed in the program for an extended period of time.

The students who participated in the special education program came to the learning centers from ten schools. The learning center schema and feeder schools are displayed below.

LEARNING CENTERS	FEEDER SCHOOLS
Aiton	Richardson, Young
Draper	McGogney, Hendley
Seaton	Harrison, Montgomery, Raymond, Bruce-Monroe, Garrison
Watkins	Wheatley

All Title I schools are eligible to participate in this program but total enrollment in the program is limited to 205 students due to funding and staff constraints.

Most of the identified students in the special education learning centers were third graders, with only three being first graders for the 1976-77 school year. A possible reason for this could be the length of the referral process and the amount of paper work that has to be completed within stringent guidelines. These guidelines are set down by the U. S. Office of Education and by the District of Columbia in order to properly place a student in the program. It is quite possible that this process might take up to a year (once a student is identified as having some kind of learning disability) and, in some cases longer. It is also quite possible that a student would go through the process of being identified for third grade Title I services, and by the time he was ready for them he would be in fourth grade and not be eligible for that help from the Title I program. In some cases, this would mean that the student would go on to the fourth grade with his learning disability and have to repeat the process again of identification, testing, interviewing, and categorization of his learning disability. It is also quite possible that he would not get any specific help until he was in the fifth grade.

Referral Procedures

The 1967-77 description of the Title I program for the District of Columbia lists two methods for student referral to programmatic service. These methods are:

(1) students shall be referred to the learning centers by the placement services of the Division of Services for the Handicapped,

(2) Title I students in need of in-depth perceptual training may be directed to the center at the local school. Cases referred to the service will undergo a screening process by the office of the Project Director.

Program Operation

According to the 1976-77 program description for the special education centers of the District of Columbia Public Schools, there were to be between 15 and 24 students at a center, with actual class size for each setting ranging from five to eight students. Each center consisted of two settings; one setting concentrated on language and perception and one on mathematics.

The morning session extended from 9:15 to 11:45 and served approximately 24 students. The afternoon session extended from 1:00 to 2:20 and served approximately 16 students. Students spent from thirty to forty minutes in each setting; however, the time in each setting varied depending on individual need. The centers closed on Wednesday afternoons; during this time the center teachers scheduled afternoon conferences with parents, regular classroom teachers, and other community agencies. The purpose of these conferences were (1) to exchange information and observations about the child's performance and behavior, (2) to agree on the child's academic needs, and (3) to discuss the teacher's recommendation for the child's future school programming.

As the child participated in the center program, his regular teacher was apprised of his progress on a monthly basis or as the need arose. The regular teacher was asked to advise the center personnel of the child's progress in the classroom. A staff conference was held prior to each reporting period in order to determine pupil improvement in performance. Following the conference a report was transmitted by the center staff to the regular teacher to be incorporated in the child's report card.

Ongoing assessment was an integral facet of the program. Once it was determined by the educational assessment team that the student no longer needed the learning center program, placement services returned the student to the regular class schedule at his local school. Here he was to receive any necessary follow-up services. Teacher aides were available to work in a regular classroom under supervision of the center teachers.

Parental Involvement

Parental involvement and support for the learning center program were developed by:

(1) home visits by the teaching staff;
(2) attendance of teachers at PTA meetings;
(3) attendance of the director at community meetings;
(4) involvement of the staff in developing curriculum materials using the home and the community as resources;
(5) reporting to the parents on the child's progress;
(6) involving parents in the evaluation of the project;
(7) regular, individual, and group meetings;
(8) parent workshops;
(9) observation of the center program; and
(10) involvement of parents in the collaborative services program.

Internal Evaluation of the Program

The internal evaluation component of the special education program for the District of Columbia Title I Schools was comprehensive and included the following activities:

(1) A wide battery of student instrumentation was administered to assess cognitive, psychomotor, and affective growth in all the children who were enrolled in the special education program between October 1976 and May 1977;

(2) student interviews were conducted on a pre-post basis by the learning center staff in order to measure changes in self-concept and attitude toward school and toward students' abilities;

(3) principals and other related professionals who utilized the learning center service were surveyed to determine the extent to which the learning center program has helped them to serve the learning disabled child;

(4) parents who had children enrolled in the centers were surveyed to determine the extent to which they felt the learning center has helped their child;

(5) the school staff utilizing the services of the Title I special education collaborative service team was surveyed and the results evaluated to determine their opinion of the effectiveness of learning center training in increasing the number of children, whose needs could be met by being returned to mainstream classes where teachers were provided with specialized consultant services.

Objective and Results

The main objective of the learning center program for the school year 1976-77 was to improve the reading and mathematics level of each child through a learning center approach. This entailed identifying, developing, and utilizing techniques and materials to improve functioning of the handicapped children in areas in which they exhibited deficiencies. Programmatic planning for these centers was concerned with the educational environment, experiences, and the content necessary to meet the needs of each child, with respect to his uniqueness and the totality of his experience.

The contextual emphasis in these centers involved a perceptual multisensory approach on reading and mathematics development. Goals of the Title I Special Education Learning Center were:

- To improve the reading and mathematics skills of Title I students with special needs through developmental learning center programs utilizing a multisensory perceptual skills approach.
- To utilize, for students with special needs, a collaborative, interdisciplinary team approach to programming, which will provide a child, his teacher and parents with a variety of problem-solving strategies.
- To provide personalized comprehensive programming for students in need of temporary special placements, so that they can achieve the specific behaviors which will allow them to be mainstreamed successfully.

The objectives of the Title I Special Education Learning Centers required for attainment of these programmatic goals included the following:

1. With the appropriate services, 66 percent of the students will increase their reading and mathematics achievements by three months over their previous average, yearly achievement. The improvement will be measured by comparison of pre-/posttest scores on the wide range achievement test scores, and by standardized achievement tests administered in the fall of 1976 and the spring of 1977.

Table 10.1 displays the achievement scores from the *Wide Range Achievement Test* administered during 1976 and 1977 and lists in grade equivalents, the means, standard deviations, and the gain scores for grades 1, 2, and 3. The scores represented in Table 14.1 are only for Title I students who were identified by the Special Education placement service. The total number of students identified and served using this method was 33. Of those 33, three were in the first grade, eight were in second grade, and 22 were in third grade. The mean gains exhibited in Table 14.1 for all three grade levels would indicate that the program had met its objectives, in regard to the increase in student reading and mathematics achievement.

Of note, however, is that the absolute gain scores decrease as the grade level increases. What this suggests is that the earlier a student's learning disabilities are identified and the earlier attempts are made to correct those disabilities, the more successful the attempt will be in relation to providing the students with the perceptual and motor reading skills needed to return to the mainstream.

It is recommended that the program be restructured to provide services to all Title I students who have need of them. In this time of constrained resources an expansion of staff would not be possible but a change of the served group could accomplish the same effect. The present staff or a part of that staff could be used to provide training to the classroom teacher in how to identify students with learning disabilities, and how to design and deliver specific services to the students in order to maximize their learning.

Another method for increasing the number of students served would involve changing the name of the program from special education to Intensive Basic Skills Remediation Task Force. By dropping any stated affiliation to special education, the extensive paper work that currently is required would be done away with and more students would as a result receive services. The current emphasis in the program on evaluation of needs in reading and mathematics and mainstreaming makes this a feasible, inexpensive way to also maximize other services. Special education, with its careful documentation and extensive testing prior to service delivery, should be the domain of the Department of Human Resources.

TABLE 10.1 WIDE RANGE ACHIEVEMENT TEST (1976-77)
TITLE I IDENTIFIED STUDENTS-SPECIAL EDUCATION PLACEMENT
MEANS, STANDARD DEVIATIONS IN GRADE EQUIVALENTS AND
GAIN SCORES FOR GRADES 1, 2, 3

GRADE 1
N = 3

	PRE (Sept. 1976)			POST (May 1977)			GAIN		
	Reading	Spelling	Math	Reading	Spelling	Math	Reading	Spelling	Math
$\bar{X}$	.86	.63	.6	1.5	1.2	1.4	.7	.6 .83	.83
s.d.	.57	.41	.34	.20	.37	1.0	.78	.26	.81

GRADE 2
N = 8

	PRE (Sept. 1976)			POST (May 1977)			GAIN		
	Reading	Spelling	Math	Reading	Spelling	Math	Reading	Spelling	Math
$\bar{X}$	1.07	.92	1.1	1.4	1.47	1.7	.51	.55	.62
s.d.	.33	.46	.70	1.0	.69	1.3	.66	.46	.75

GRADE 3
N = 22

	PRE (Sept. 1976)			POST (May 1977)			GAIN		
	Reading	Spelling	Math	Reading	Spelling	Math	Reading	Spelling	Math
$\bar{X}$	1.18	1.35	1.53	1.75	1.82	2.54	1.53	.45	.65
s.d.	.56	.54	.56	.75	.80	.92	.45	.45	.45

TABLE 10.2 TEACHER REPORTED CHANGES IN STUDENT BEHAVIORS BY GRADE BY CENTER

Grade	(N)	Interest in School — (Mean)	Social Adjustment — (Mean)	Peer Interaction — (Mean)	Self-Concept — (Mean)
K	14	1.65	.93	.95	1.00
1	32	1.47	.88	.81	1.20
2	21	1.50	1.08	.96	1.12
3	33	1.20	.85	1.02	1.16

2. Provided with the appropriate services, 75 percent of the students will show a change in areas such as interest in school, social adjustment, and self-concept, as measured by pre/posttest scores on (a) regular teacher evaluation forms; (b) student self-report; and (c) Learning Center teacher's child report form submitted between October 30, 1976, and May 30, 1977.

Table 10.2 details the change in student growth as a result of participation in the program Students showed all positive changes in interest in school, social adjustment, self-concept and peer interaction as reported by their teachers in Table 14.2. A review of the talley of parent reports, provided by the director of special education, shows that a majority of parents noted positive changes in their children's attitudes and performance in school and at home as a result of their participation in the program.

3. Provided the services of the collaborative program of the Title I Special Education Learning Centers, teachers will show a substantial gain in their ability to set specific goals for their children as measured by teacher evaluation forms.

A review of the information provided to NTS shows that teachers achieved this objective during the 1976-77 school year. Thirty-three of 37 teachers reported that their ability to set specific instructional goals for students has been highly improved as a result of their participation in the collaborative services program.

4. Provided with the appropriate services, 50 percent of the identified students exhibiting a developmental lag in perceptual motor skills will show growth in perceptual development by comparison of pre-post performance on the *Frostig Developmental Test* and the *Motor Developmental Survey* by May 30, 1977.

A review of available records shows that this objective has been met by the program.

TABLE 10.3 SUMMARY OF PARENT LEARNING EVALUATIONS OF THE TITLE I SPECIAL EDUCATION LEARNING CENTERS, ACROSS ALL CENTERS

Child's Progress	Number of Responses	Percent of Total
Very Satisfied	59	56.1
Satisfied	31	29.5
Not Satisfied	7	6.66
No Response	8	7.61
Total	105	99.87

Helped Your Child	Number of Responses	Percent of Total
Very Much	70	66.6
A little	22	20.9
No help	3	2.8
Don't know	4	3.8
No response	6	5.7
Total	105	99.8

CHAPTER XI
PRIVATE SCHOOLS

Program Description

The Title I regulations state that:

> Each local education agency shall provide special educational services designed to meet the special educational needs of educationally deprived children residing in its district who are enrolled in private schools. Such educationally deprived children shall be provided genuine opportunities to participate, therein consistent with the number of such educationally deprived children and the nature and extent of their educational deprivation.

Federal regulations pertaining to the Title I funding declare that private schools are not eligible for Title I monies, but pupils from private schools are eligible. The pupils' participation is based on educational need as well as residency in a geographic area of the city which is designated as a Title I project district. The selection of Title I eligible students is subject to change as eligible public school attendance areas change.

A review of private Title I schools indicated that approximately 800 Title I students in grades 1 through 8 in six schools qualified for participation in the Title I program. Fewer than 600 were provided services. Services were provided by four reading and five mathematics resource teachers. Of these nine resource teachers, one reading and one mathematics teacher served more than one private school. The District of Columbia Title I program provides funds for salaries for two private school coordinators, one reading, one mathematics, who work with private schools in determining the educational need of children residing within the designated attendance areas. These coordinators were under the direct supervision of the Title I director.

Information provided to the evaluation team indicates that six schools were served with approximately 600 students during the 1976-77 school year. This showed a marked increase of 20% in enrollment over the 1975-76 program. Both coordinators were governed in their jobs by "guidelines," which are general in nature and which include rules of the Board of Education and OE. Also determining the policy of the coordinators were Title I regulations, policies, and procedures that were established by the Title I director, and that were dependent on their extensive knowledge and understanding of Title I requirements and restrictions.

An important component of the coordinator's duties was to act as a liaison to the private school program. The coordinator's role, in this regard, is described as serving as liaison between the Title I central administration and participating private schools to insure that appropriate equipment, materials, and services are made available on a loan basis and that their use is restricted to Title I activities. The coordinator also "designs and directs a special mathematics/reading program for private school Title I students during the regular school term."

Program Objectives

The focus of the program, which is based on assessment of needs, continued as it had in previous years to be on the development of the basic skills in the cognitive domains of reading, mathematics, and written and oral communication. Learning Center instruction was centered around a diagnostic-prescriptive approach and was skills-oriented utilizing the most appropriate curriculum materials. The skills development program was designed to respect the students' individualities by encouraging work in small groups and to insure an instructional climate that promoted development and success.

Two main objectives were established for private schools. The objectives were as follows:

I. Cognitive Skills

Given 7 months of instruction in the Title I Non-Public Total Learning Center, Title I students will improve in their achievements so that the mean difference of the standard scores in reading and mathematics between Title I students and non-Title I students will not be as great in the spring of 1977 as it was in the fall of 1976, as measured by standardized achievement tests.

A. Given 7 months of instruction in the Total Learning Center, Title I students (1-8) will have a mean achievement on a standardized achievement test at or close to the large-city norm to decrease the need for remediation in the upper grades.

B. Given 7 months of instruction in the Total Learning Center, Title I students (1-8) will have a mean achievement on a standardized achievement test beyond the expected achievement without the services of Title I.

II. Affective Behaviors

Given 7 months of involvement in the Title I Non-Public Total Learning Center, Title I students will show an observable positive change in their affective behaviors as reported by teachers, parents, and other school-related personnel.

A. Given 7 months of instruction in the Total Learning Center, Title I students will have a more positive interest in and attitude toward the school curriculum, as observed by school staff and parents.

B. Given 7 months of instruction in the Total Learning Center, Title I students will relate to their peers and the staff in a more positive manner, as observed by school staff, parents, and students.

Student Achievement

The Title I private school student achievement results for reading and mathematics are presented in Tables 11.1 and 11.2, respectively. The scores for each school were provided to the evaluator by the private school coordinator. Students' scores were presented as a matched set of pre-post test results for each student. The presented scores represent only about one-half of the students in the private school program. Only students in grade levels which had pre-post scores are reported in the tables. Since scores for all students were not available, these results should be viewed with a degree of caution and are not necessarily representative of the total program. The reader will also note that some of the sample sizes of various grade levels are small. The pattern for reading achievement scores of students in Table 15.1 shows that students in grades 1-8 enter the program below grade level, since this is a criterion for selection. The deficit between documented entering-grade equivalent and expected-grade equivalent increased by grade level; the higher the grade level, the greater the deficit. This pattern was also obtained for mathematics achievement scores. A comparison of last year's and this year's results is difficult since there was an absence of data provided to track studennts from year to year. Another hypothesis for the low entry scores could be that new students are being introduced into the program each year, but here again, little or no data were available to support this hypothesis.

The gain scores documented in Tables 11.1 and 11.2 show that the private schools achieved their objectives. Since students were not tested in the affective domain, no data were available to document this objective; no statement can be provided concerning their affective domain growth.

TABLE 11.1: READING ACHIEVEMENT TEST RESULTS (IN GRADE EQUIVALENTS) FOR PRIVATE SCHOOLS

Total Reading

Grade	N.	Pre (GE) Sept. 1976	Pre	Post (GE) May 1977	Post	Gain
1	31	0.7	CTBS Form S Level B	1.5	CTBS Form S Level B	.8
2	77	1.6	CTBS Form S Level C	3.2	CTBS Form S Level C	1.6
3	38	2.1	CTBS Form S Level 1	3.1	CTBS Form T Level 1	1.0
4	50	2.8	CTBS Form S Level 1	3.5	CTBS Form T Level 1	.7
5	52	3.5	CTBS Form S Level 2	4.9	CTBS Form T Level 2	1.4
6	55	4.5	CTBS Form S Level 2	5.7	CTBS Form T Level 2	1.2
7	21	4.4	CTBS Form S Level 3	6.4	CTBS Form T Level 3	2.0
8	24	5.8	CTBS Form S Level 3	8.2	CTBS Form T Level 3	2.4

TABLE 11.2: MATHEMATICS ACHIEVEMENT TEST RESULTS (IN GRADE EQUIVALENTS) FOR PRIVATE SCHOOLS

Total Mathematics

Grade	N.	Pre (GE) Sept. 1976	Pre	Post (GE) May 1977	Post	Gain
1	18	0.6	CTBS Form S Level B	1.9	CTBS Form S Level B	1.3
2	48	1.6	CTBS Form S Level C	2.6	CTBS Form S Level C	1.0
3	44	2.2	CTBS Form S Level 1	3.5	CTBS Form T Level 1	1.3
4	49	3.1	CTBS Form S Level 1	4.0	CTBS Form T Level 1	.9
5	51	3.4	CTBS Form S Level 2	4.6	CTBS Form T Level 2	1.2
6	52	4.3	CTBS Form S Level 2	5.4	CTBS Form T Level 2	1.1
7	36	6.0	CTBS Form S Level 3	7.3	CTBS Form T Level 3	1.3
8	17	7.4	CTBS Form S Level 3	8.0	CTBS Form T Level 3	.6

CHAPTER XII
IMPACT OF INDIVIDUAL AND GROUP

For the 1976-77 Title I Evaluation, data were gathered from nine domains reflecting student background and characteristics, and group affective and achievement profiles. The domains are:

(1) pretest student achievement;
(2) student background;
(3) student posttest self-concept;
(4) a Title I program participation indicant;
(5) classroom pretest achievement;
(6) classroom posttest self-concept;
(7) school pretest achievement;
(8) school posttest self-concept;
(9) school identification (a classification variable).

Commonality analysis is used to relate predictor domains to posttest reading and mathematics scores, providing a partitioning of the explained variance into those components of variance uniquely associated with each predictor domain, and that component of variance which is confounded among the domains. This analysis will reveal the relative importance of these nine domains in association with the achievement posttest scores.

BACKGROUND OF THE ANALYSIS

The analysis used to determine the components of success is commonality analysis. Commonality analysis partitions the variance of an outcome variable (total reading, total math) into those percentages of the variance that can be uniquely associated with each of the predictor domains by themselves, and those percentages which are common to two or more of the predictor domains, for all of the possible combinations of the predictor domains with each other. Commonality analysis treats the confounded percentages of variance in the outcome variables that are jointly associated with combinations of domains as separate partitions of the outcome variance (called commonalities). These confounded percentages of variance in an outcome variable that are associated jointly with combinations of domains are not included in the estimation of the degree of unique association of that outcome variable with any single domain. The irreducible percentage of variance in an outcome variable that is associated solely with a single domain and no other is called the domain's uniqueness. The uniquenesses and commonalities are percentages of the variance of an outcome variable and are derived from total R^2s that are associated with various regression analyses. The appropriate methodology is discussed in detail in Cooley and Lohnes, 1976. The present analysis will follow the lead of Cooley and Lohnes and present only the uniquenesses associated with each of the domains, and the total of the commonalities that are associated with all the various combinations of two or more domains.

This analysis must begin with the presumption that the individual student has a large impact upon the student's post-test achievement test scores. The individual student will be represented in this analysis by pretest achievement scores, self-concept scores, and individual characteristics as reported by the student's teacher on the Student Information Form. In a paper by Bland and Stenner (1976), a commonality analysis was used to determine the relative significance of various individual characteristics and instructional process variables upon the students' post-test achievement scores. In that paper it was found that instructional process variables uniquely account for between 3% and 12% of the variance in the students' post-test achievement scores. In addition to these instructional process variables, the social context of instruction and learning are very significant in association with students' post-test achievement scores. A commonality analysis of individual and context variables will be presented in order to indicate the relative significance of individual characteristics, and of the total social context, and of its affective and cognitive components, at both the classroom and school level.

Three instruments were used in this study:

- *California Test of Basic Skills (CTBS-S & T)* was administered in the fall of 1976 and the spring of 1977 to first, second and third grades in Title I schools. Total reading and total math scores are used in this analysis. The overall achievement test results are discussed in Chapter 6.
- *Student Information Form (SIF)* was completed in the spring of 1977 for each student by the student's teacher. The SIF data are discussed at greater length in Chapter 5. The form includes:
  (1) A rating of student strengths:
  perseverence, motivation, acceptance of responsibility, aggressiveness, and peer interaction (rated 1-5).
  (2) Areas interfering with the student's progress:
  physically disruptive, peer affinity, verbally disruptive, and resentment of authority.
  (3) Family support:
  PAC, parent teacher conferences, telephone contacts, written contacts, attendance at school activities, encouragement of student achievement, provision of enriching experiences.
  (4) Problems which require Pupil Personnel Services:
  withdrawn, aggressive, economic need, absenteeism.
  (5) Special needs interfering with classroom performance:
  lack of adult supervision, appearance, untreated health problems, inadequate diet.
  (6) Problems interfering with educational progress:
  hearing, speech, vision, emotional, dental.
  (7) Priority for the student to receive Title I services relative to the needs of the students in the school (Rated 1-4).
  (8) Student's communication patterns:
  bilingual, dialect, aural, nonverbal, nonstandard English.
  (9) The degree to which the student's background experience enables the student to function successfully in the classroom (Rated 1-3).

- *Self Observation Scales (SOS)* (Stenner and Katzenmeyer, 1973) were administered in the spring of 1977 to first, second and third graders in Title I schools. The SOS is a nationally normed self-report measure of four factor analytically derived dimensions of children's affective behavior. The four factor scores are self-acceptance, self-security, social maturity and school affiliation. The overall SOS test results are discussed at greater length in Chapter 9.

From the three instruments that were used in the evaluation, a total of nine domains were derived, at the individual, classroom, and school level. The domains are:

- *Pretest student achievement (student achievement),* consisting of the pretest reading and mathematics total scores and their squares.
- *Student characteristics,* consisting of dummy variables derived from all of the questions listed from the SIF.
- *Student self-concept,* consisting of the student's four factor scores on the SOS.
- *A Title I program participation indicant (Title I),* indicating whether or not the student participated in the Title I program.
- *Classroom achievement,* consisting of the classroom mean, standard deviation, and skewness on the pretest total reading and total mathematics scores.
- *Classroom self-concept,* consisting of the classroom mean, standard deviation and skewness on each of the four SOS scales.
- *School achievement,* consisting of the school mean, standard deviation, and skewness of the pretest total reading and total mathematics scores.
- *School self-concept,* consisting of the school mean, standard deviation, and skewness on each of the four SOS scales.
- *School ID number (#),* an ID number for each school, used as a classification variable.

The student domains, class domains, and school domains are grouped together and considered as a whole, and the achievement and self-concept domain are also considered as a whole.

DISCUSSION OF THE ANALYSIS

TABLE 12.1: COMMONALITY ANALYSIS:
PERCENTAGES OF VARIANCE IN ACHIEVEMENT TESTS SCORES THAT ARE ASSOCIATED WITH VARIOUS VARIABLE GROUPS (DOMAINS).

	Grade 1		Grade 2		Grade 3	
N	1341		1441		1444	
	Reading	Math	Reading	Math	Reading	Math
Single domains (% of variance in unique association with domain)						
School ID #	4.84	2.18	2.35	1.95	3.81	3.62
School Achievement	1.21	1.69	.59	.39	.50	2.46
School Self-Concept	1.27	3.0	1.27	3.17	3.54	2.88
Class Achievement	.87	.41	.58	.42	.25	.91
Class Self-Concept	1.59	2.25	1.89	3.16	.44	1.47
Title I Program	1.12	2.13	.59	2.55	.81	.34
Student Characteristics	15.35	9.93	13.82	7.35	7.55	6.7
Student Achievement	6.30	6.01	7.42	8.06	9.92	9.79
Student Self-Concept	.80	1.71	.71	1.55	.67	.64
Totals of % of unique associations for selected variable domain groups						
Total from School	7.32	6.87	4.21	5.51	7.85	8.96
Total from Class	3.58	2.66	2.47	3.58	.69	2.38
Total of School, Class & Title I	12.02	11.66	7.27	11.64	9.35	11.68
Total from Student	22.45	17.65	21.95	16.96	18.14	17.13
Total from Achievement	8.38	8.11	8.59	8.87	10.67	13.16
Total from Self-Concept	3.66	6.96	3.87	7.88	4.65	4.99
Summary						
Total ($100R^2$)	62.10	55.47	66.83	59.93	65.02	62.24
Total of Uniquenesses	33.35	29.31	29.22	28.60	27.49	28.81
Total of Common	28.75	26.16	37.61	31.33	37.53	33.43
Total of Unexplained	37.90	44.53	33.17	40.07	34.98	37.76

Table 12.1 summarizes the results of the separate commonality analyses for total reading and total mathematics, at grades one, two, and three. The summary statistic that is reported in Table 12.1 is the total percentage of the variance in post-test achievement (reading or mathematics) that is associated with each predictor domain. This percentage is just $100R^2$, for the R^2 of the total model in a regression analysis. In Table 12.1, the top group of numbers contains the percentages of variance in either reading or mathematics that are uniquely associated with the domains listed in order at the left of the table. The second group of numbers in the table contains sums of the uniquenesses of the domains in the selected groups of domains, as listed at the left of the table. The combinations of domains that are listed are described below in the discussion. The third group of numbers is an overall summary of the percentages of variance in the post-test achievement scores that are uniquely "explained," jointly "explained," and "unexplained." Figure 12.1 is a graphical presentation of some of the data from Table 12.1, and is included as another means of presenting the data. It must be remembered that in these analyses, the indicant of Title I program participation is being treated as just one variable among a larger group of variables. These analyses are not intended to compare Title I and non-Title I students.

An examination of Table 12.1 reveals that in terms of the percentage of variance uniquely associated with a domain, the first and second most important domains are always the individual student characteristics and student pretest achievement scores. In the first grade, student charac-

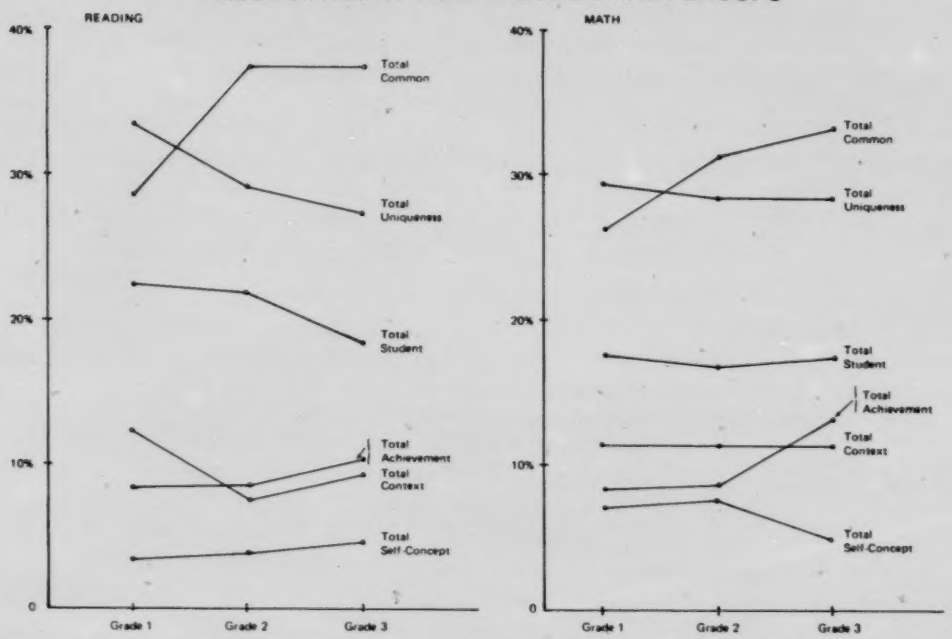
teristics are more important than pretest achievement scores, but by the third grade the pretest achievement scores are more important, for both reading and math. Overall, when the student characteristics and the student's pretest achievement scores are combined with the student's self-concept scores to form a larger domain of all student variables, the total of the uniquenesses associated with the separate domains represents between 17% and 22.5% of the variation in post-test achievement scores. The total of the three uniquenesses is associated with the separate domain of all student variables because of the commonalities that are associated jointly with any of the other domains. In other words, the sum of the uniquenesses of the three student-centered domains is a conservative estimate of the true uniqueness of the combined total student-centered domain.

In a similar fashion, all of the predictor domains centered on the class as a whole can be combined, and the uniquenesses associated with the affective and achievement profile of the class can be combined to give a conservative estimate of the uniqueness associated with the combined class centered domain. When this is done, the combined class affective and achievement profile is generally associated with between 2.5% and 3.5% of the variance in post-test achievement scores. If the school affective and achievement domains are combined in a similar fashion with the domain consisting solely of a school ID number, the total school domain is conservatively estimated as being associated with from 4.25% to 9% of the variance of the post-test achievement scores. On the basis of either theory or common sense it would seem more reasonable to expect that the classroom context would be more immediately relevant to the achievement outcome for students than the school context. The variables used in this analysis, however, reflect only the class as a group of students, through their pretest achievement and post-test self-concept group profiles. The analysis previously cited (Bland and Stenner) indicates that when teacher-centered variables are included in a commonality analysis, between 3% and 13% of the variance in the students' post-test achievement scores can be uniquely associated with these instructional process variables. If these two percentages due to the class and to the teacher are combined, the classroom context together with the instructional process is possibly able to be associated with between 5.5% and 15.5% of the variance in post-test achievement. In that case, the expected relationship between the relative importance of the school context and the total classroom context and process would be supported.

If all of the domains associated with the school and with the class are combined with the domain that consists of just the Title I program participation indicant, then a total group context domain can be created; and can be contrasted with the total individual student domain. The total context domain is conservatively estimated as being associated with between 7.5% and 12% of the variance in post-test achievement scores for an average of 10.6%. This is, of course, never as much as is associated with the total student domain, which is associated on the average (over grades, reading and math) with 19% of the variance in the post-test achievement scores. If we now proceed as above, and add to the estimates of the uniqueness of the total group context the 3% to 12% of the variance in post-test achievement that is uniquely associated with the instructional process, a new estimate of the importance of the total group context and instructional process as a combined domain can be obtained. The combined group context and instructional process domain is possibly able to be uniquely associated with between 10.25% and 24% of the variation in the post-test achievement scores. In this case, the combined group context and instructional process domain could account for more of the variation in the post-test achievement test scores than the total student domain. Of course, the estimates of the relative importance of the student domain are based upon limited data about the student, and could be grossly below their real values. At the same time, the estimates of the relative importance of the combined group context and instructional process domain are based upon two separate series of analyses. Combining the two estimates of the uniquenesses for domains that are derived from separate analyses will generally overestimate the uniqueness associated with the combined domain that would be derived from a single analysis.

Another interesting and valuable contrast is provided by examining combinations of domain by content area. The student, class, and school achievement domains can be combined and contrasted with the combined student, class, and school self-concept domains. The combined achievement domains are conservatively estimated as being associated with between 8% and 13% of the variance in posttest achievement, for an average of 9.63%. The combined self-concept domains are conservatively estimated as being associated with between 3.75% and 9% of the variance in post-test achievement

FIGURE 12.1: PERCENTAGES OF VARIANCE IN ACHIEVEMENT ASSOCIATED WITH VARIOUS DOMAIN GROUPS



scores, for an average of 5.34%. If the separate student, class, and school domains are examined, it is interesting to note that the relative significance of achievement and self-concept is different between the total context domain and the total student domain. In the total individual student domain, pretest achievement scores are more important than self-concept profile is more important in association with individual post-test achievement scores than the group achievement profile.

CONCLUSION

In summary, if all the domains are taken together, the combination of all of their uniquenesses and commonalities accounts for between 55.5% and 67% of the variance in post-test achievement scores, for an average of 62%. This is a very good overall percentage of "explained" variance, especially when the limits of the reliability of the achievement test are considered. When the additional percentages of variance that are associated with teacher process and characteristics are included, the student post-test achievement activities are very close to being totally "explained," close to the limits of error free variations in post-test achievement scores. An analysis should be conducted with the total pool of variables including teacher data in order to further clarify the relative importance of various domains in effecting post-test achievement scores.

At each grade the percentage of variance accounted for in reading is higher than in math. The most important single domain in association with post-test achievement is always either the student's individual characteristics, or the individual's pretest achievement score level. On the other hand, if all of the group profile variables are combined, and if we may include the results from Bland and Stenner about the percentage of variance that is uniquely associated with teacher process variables, then the total educational context and process are generally about as highly associated with post-test achievement scores as the total combination of all of the student's individual scores and characteristics. In addition, it is possible for the total educational process and group context to have a generally more profound impact upon student achievement than the student's previous achievement or individual characteristics. At the class and school levels, the group self-concept profile is found to be more significant than the group pretest achievement profile. At the individual student level, the individual's pretest achievement profile is more important than the individual's self-concept profile.

CHAPTER XIII
SPECIAL PROGRAMS

The incorporation of feedback information concerning program operation into the process of program design and modification is an integral component of program management. One source of such information for managers of the Title I program is previous years' Title I evaluations, which help to identify the needs of Title I students. Hence, as part of a continuing effort to serve the documented needs of these students, leaders of the Title I program utilize feedback information to design and implement pilot programs intended to address these needs. Two examples of this management initiative are the STELLAR Project and the Collaborative Saturated Services Program (CSSP), which were designed to meet, in an innovative manner, the needs of Title I students. Preliminary results of evaluations of these pilot programs are presented in the following sections of this chapter.

THE STELLAR PROJECT: A PILOT STUDY

The fundamental goal of the STELLAR Project was to improve the reading skills of Title I eligible students. In terms of the reading achievement of Title I students, the goal of the STELLAR Project was that after four months of STELLAR Project service, a majority of the Title I students who received the service would be expected to master at least 70 percent of the prescriptive reading skills as measured by a criterion-referenced reading test. The mean percentage of mastery of prescriptive reading skills for STELLAR Project participants was expected to exceed that of a comparison group of students in regular Title I reading labs.

The STELLAR Project had five components:

- An organization structure that provided for each lab a team that consisted of a fulltime reading-language teacher, an educational aide, a parttime program assistant, and a parent assistant. The labs were designed to deliver a regular service for 55 minutes each day, five days a week, for a cycle of four months.

- A curriculum that provided an individually prescribed instructional procedure for each participating student.

- Specialized staff training that was intended to improve the competencies of Title I reading-language teachers and educational aides so that they might provide more effective instruction in reading and language for Title I students.

- Parent training that was designed to aid parents in managing the behavior of their children, and to provide for parents techniques which could be used at home to reinforce learning.

- Staff support and assistance in each of the four program components listed above.

One of the most salient features of the STELLAR Project was the specialized staff training. This program was an extended attempt to help the teachers help the students. When it is considered that the development of the students' achievement is in direct response to the educational stimuli provided for them by their teachers, the significance of teacher qualifications becomes clearly apparent. Hence any effective attempt to encourage the development of the teaching staff is critical to continued improvement in student achievement. The teacher training program extended throughout the entire school year, and the full results of this component of the STELLAR Project pilot study will not be apparent until the 1977-78 school year. Because of this, the staff development component of the STELLAR Project pilot study was not evaluated.

The data for student achievement included criterion-referenced test results for only 60 percent of the students in the experimental and control groups. Because of the noncomparability of the various levels of the Prescriptive Reading Test (PRT), and because of the incomplete data, no conclusive analysis of the effectiveness of the pilot STELLAR Project can be conducted. The data that have been provided, however, are presented and discussed, although no definitive conclusions may be drawn because of the difficulties in the experimental design.

STELLAR Project Data

In Table 13.1, calculation of the numbers and percentages of students from the STELLAR and control groups are presented according to the level of Prescriptive Reading Test (PRT) they were administered at the pretest and the posttest, for grades 1 to 3. While the total number of students who participated in the STELLAR Project was approximately one thousand, numbers in the table include only those students for whom valid data could be obtained. One feature of this table is that, on the whole, the students in the control group at each grade above grade 1 were generally administered a lower level test than the students in the STELLAR Project at the same grade. An additional feature of Table 13.1 is that the changes from pre to post in the numbers and percentages of students from each grade (and from both the STELLAR and control groups) who were administered each level of the PRT indicate that a large number of students from both groups took different levels of pre- and posttest. This situation is likely caused by the desire on the part of test administrators to give to students that level of the PRT which would most accurately and appropriately measure their level of reading achievement at the time of testing. Such out-of-level testing can be good practice, because if test levels are appropriately assigned to individual students, then the students will have the best possible opportunity to demonstrate the true level of development of their abilities.

TABLE 13.1 PERCENTAGES OF STUDENTS FROM EACH GRADE WHO RECEIVED EACH LEVEL OF THE PRT

	STELLAR						CONTROL					
	Level A		Level B		Level C		Level A		Level B		Level C	
PRE	N	%	N	%	N	%	N	%	N	%	N	%
Grade 1	106	100%					178	100%				
Grade 2	41	33%	83	67%			111	61%	71	39%		
Grade 3	16	14%	60	52%	39	34%	34	17%	119	60%	45	23%
POST												
Grade 1	111	100%					164	100%				
Grade 2	17	15%	99	85%			78	43%	105	57%		
Grade 3	20	16%	55	45%	48	39%	12	7%	95	52%	74	41%

On the other hand, the PRT tests administered to students were also intended to provide data that would be used in evaluating the pilot STELLAR Project. Unfortunately, no cross-level norms exist for the PRT that will allow students from the same grade who were administered different levels of the PRT to have their different level PRT test scores translated to a common score based upon cross-level norms. In fact, the PRT scores of any individual who was administered different levels of the PRT at the pretest and the posttest cannot be compared because of this lack of cross-level norms. Consequently, the only students whose PRT performance can be compared from pretest to posttest are those who were administered the same level of PRT on both occasions. One immediate consequence of this fact is that only those students who stay in the same level of achievement can be compared, so that any students whose reading development progresses during the year to such an extent that they should be administered different levels of the PRT at the pretest and posttest cannot be used for comparison purposes. An additional consequence of the lack of cross-level norms is that for each grade, a separate comparison between the STELLAR and control students would have to be made for all of the students from that grade who were administered each of the separate levels of the PRT.

When all of these difficulties are considered along with the small sample of data that are available, then the combination of these problems with the experimental design introduces so much distortion into the PRT test scores that little reliable analysis can be conducted or conclusions drawn from the

data that are available. For these reasons the nationally normed CTBS achievement data have not been used to provide a comparison of the STELLAR and control groups. Consequently, the STELLAR and control groups cannot be compared, and the STELLAR Project pilot study was not evaluated as to impact.

Table 13.2 presents a summary of the PRT data for all of the students from both groups who were administered the same level of the PRT at the pretest and the posttest. The data are presented in terms of mean raw scores that indicate the average number of objectives mastered by the students from each group, and from each grade, for all of the levels of the PRT. Each of the levels of the PRT is composed of a different number of items and objectives, so that the mean scores should not be compared from level to level. The major feature of this table is that four out of six of the comparisons of the STELLAR and control group gains show that the STELLAR students gained more than the control group. It must be remembered that the STELLAR students have lower pretest scores, so that they may have more measurable room for improvement, and there could be a ceiling effect that limits the possible mean gain scores for the control group. Nevertheless, these data are encouraging in the sense that a more rigorous experimental design might substantiate the apparent better gains for the STELLAR students.

TABLE 13.2 SUMMARY OF PRT TEST MASTERY INDICATOR MEANS FOR STUDENTS WITH SAME LEVEL PRE AND POST TESTS

				Pretest			
	Grade	N-STELLAR	N-CONTROL	STELLAR	Control	T	Prob ▲ (T)
Level A	1	91	145	11.2	13.0	-3.6	0.0003
21 Items	2	13	53	12.7	14.8	-1.6	0.1115
	3	4	6	14 0	14.5	-0.3	0.7722
Level B	2	67	46	18.3	23.3	-3.6	0.0006
45 Items	3	30	65	25.0	28.2	-1.8	0.0679
Level C	3	26	29	20.3	21.3	-0.6	0.5485
39 Items							

		Posttest				Gain			
	Grade	STELLAR	Control	T	Prob▲(T)	STELLAR	Control	T	Prob▲(T)
Level A	1	15.8	17.3	-3.3	0.0013	4.6	4.3	0.6	0.5181
21 Items	2	16.4	17.5	-1.5	0.1391	3.7	2.7	0.7	0.4692
	3	19.2	16.3	0.0540	5.2	1.8	1.7	0.1191	
Level B	2	28.5	34.6	-3.8	0.003	10.2	11.3	-0.8	0.4536
45 Items	3	33.0	34.5	-1.0	0.3257	8.0	6.3	1.3	0.1888
Level C	3	25.8	27.7	-1.1	0.2967	5.6	6.4	-0.6	0.5211
39 Items									

Average STELLAR Gain: 6.74
Average Control Gain: 5.50

COLLABORATIVE SATURATED SERVICES PROGRAM (CSSP)

The documented trend of retrogression in learning at the third grade level calls for a particular treatment strategy over and above the present method of Title I treatment. Although Title I provides a variety of services, it is seldom that the majority of Title I students receives all of the instructional and support services that the program offers. A systematic approach has not been formulated that would guarantee the delivery of a "saturation" of all Title I services, simultaneously, to a given population for a designated period of time. The CSSP program was an innovative attempt to provide a saturation of Title I services to third grade Title I students.

Population

Identified Title I third graders who attended 12 Title I target schools in Region V of the Public Schools of the District of Columbia comprised the eligible target population. These students were those who had been identified to receive Title I services on the basis of the percentile rankings of their scores from the fall-administered standardized achievement test (50th percentile or lower); retention in grades K, 1, 2, or 3, regardless of test score; and age (two or more years older than their normal age for grade). From among this group, school personnel selected those third grade students who were "most in need" on the basis of teacher judgment of student progress and test scores.

The goal of CSSP was to produce an increase in the reading-language and mathematics achievement of identified Title I students in grade three of 12 Title I schools in Region V of the Public Schools of the District of Columbia. Terminal objectives of the program included the following:

- Given four months of the saturated multiple services of Title I, third grade students in the selected schools would show a mean gain better than one month's growth in reading achievement for one month of instruction as indicated by a standardized achievement test.
- Given four months of the saturated multiple services of Title I, third grade students in the selected schools would show a mean gain better than one month's growth in mathematics achievement for one month of instruction as indicated by a standardized achievement test.
- Given four months of the saturated multiple services of Title I, third grade students in the selected schools would show a mean gain between January and May 1977 superior to the mean gain shown by the same students between September 1976 and January 1977.
- Given four months of the saturated multiple services of Title I, 75 per cent of the third grade students in the selected schools would show an increase in positive affective behaviors as observed by classroom teachers.
- Given four months of staff development activities, resource teachers, classroom teachers, and educational aides would demonstrate competencies in identified areas of instructional need of third grade students as evidenced by performance documented by supervisors.
- Given four months of staff development, pupil personnel teams would demonstrate effectiveness in providing for and alleviating the identified needs of Title I third grade students in the areas of attendance, clothing, health needs, and psychological and social services, as evidenced by services rendered and remediation achieved.

The Collaborative Saturated Services Program (CSSP) "saturated" identified Title I third grade students with supplementary Title I instructional and learning-support services. Utilizing a structured and systematic approach, the design provided for:

- Appraisal of student instructional and learning-support needs;
- Identification of referral services, referenced to the appraised needs;
- Delivery of Title I services; and
- Assessment of the effectiveness of referral services in alleviating student needs.

Services included the following:

Instructional Services	*Learning-Support Services*
Reading lab instruction	Cultural enrichment and field trips
Mathematics lab instruction	Pupil Personnel team services
Educational aide assistance	Parental involvement
After-school tutorial assistance	Health Aide services

Results

The results for the September to February and February to May comparison groups (Table 13.3) demonstrate a definite trend toward gains in the latter group. In three of four comparisons, the spring group mean raw scores gains are not only greater, but are also statistically significant at better than the $p = .05$ level. The fourth comparison shows a small mean gain favoring the September to February group, but further statistical analysis suggests this to be a chance occurrence having no implications.

TABLE 13.3 RAW SCORES FOR THIRD GRADE CSSP PARTICIPANTS IN LANGUAGE, READING, AND MATHEMATICS

Subtest	Test Group	N	Raw Score Mean Score Gain	S.D.	Prob.
Language	Sept.-Feb.	137	5.35	9.58	.053
	Feb.-May	127	4.62	9.33	
Reading	Sept.-Feb.	175	4.36	7.57	.03
	Feb.-May	181	6.16	8.80	
Mathematics	Sept.-Feb.	168	5.76	8.23	.001
	Feb.-May	177	9.77	10.42	
Total Battery	Sept.-Feb.	126	14.81	18.1	.006
	Feb.-May	120	21.59	20.53	

The most impressive part of these data is the gain made in the total battery score by the February to May group. The mean gain is not only much greater absolutely, but is also significant at $p = .006$. This result alone should be enough to justify the CSSP program, but, as previously mentioned, additional supporting evidence is also present.

One other factor should be considered in the analysis of these data. The CSSP program was new this year, and consequently insufficient time and evidence have been available to thoroughly evaluate it. However, the previously mentioned trends in the data, as well as the experiences gained in the program this first year, suggest the efficiency of the program for meeting the needs of Title I students.

CHAPTER XIV
LANGUAGE ASSESSMENT

A pilot study was launched during this year's evaluation to assess Title I students' language facility. As mentioned earlier (Chapter 1), this skills area is characterized by a blending of physiological and cognitive abilities. Physiologically, individuals must be able to speak, hear, and see to communicate with verbal language, and they must be able to coordinate their musculature to be communicative in nonverbal expressions. Cognitive abilities for processing input information and translating it into output information are the bases for any communication between one individual and another.

Table 14.1 shows how types of communication can be classified according to their behavioral modes and their stimulus types. For example, individuals actively emit a verbal response when they speak or write. They respond or react nonverbally by conceptualizing (hearing or seeing) words spoken or written. They actively emit nonverbal responses by gesturing, drawing symbols or pictures, and acting out roles, but they react by interpreting sounds, symbols, or visually perceived actions. The emitting of stimuli requires active, muscular participation; the responding initially to stimuli requires visual or aural receptivity.

Table 14.1 Classification of Communication Skills of Domains of Stimuli and Behavior

		BEHAVIORAL MODE	
		Emitting	Responding
STIMULUS TYPE	Verbal	Speaking Language Writing Language	Hearing Language Reading Language
	Nonverbal	Gesturing Drawing Symbols/Pictures Acting Out Behaviors	Interpreting Sounds Interpreting Symbols Interpreting Visually Perceived Actions

Nonverbal communication is deemed to be as significant as verbal communication by the Title I program staff. Thus, it was decided that that concept would be investigated. However, because the Comprehensive Test of Basic Skills (CTBS) and the Prescriptive Reading Test (PRT) were already being used to measure reading achievement, this area of verbal communication was excluded. Initially, the Title I program staff and the evaluator wanted to assess writing ability. However, there was too little time this year to do so adequately.

The areas of communication assessed included visual, aural, oral, and general gross and fine motor coordination abilities. The assessment provided the program staff and the evaluator with a comprehensive description of the functioning language skills. The overriding purpose of the assessment was to gain an understanding (not an evaluation) of the characteristics of language usage and the facility of Title I students in the District of Columbia. A limited assessment of current linguistic characteristics was the object of the investigation.

DEVELOPMENT OF THE ASSESSMENT TEST BATTERY

The basis for the limited assessment stems from the 1975-76 Title I Evaluation in the D.C. public schools. On *Student Information Forms* (SIF's) Title I teachers reported that one-third of the primary grade students (approximately 6,500) in all Title-I-designated schools evidenced some type of linguistic difference which interfered with successful classroom performance and, in the opinion of teachers at least, acted as an inhibitor of learning. These findings indicated a need for a closer examination of how language differences are related to achievement and a controlled intervention study designed to improve language facility.

A Language Assessment Committee proceeded over the next 5 months to carve out the objectives and the assessment strategy for this portion of the evaluation design. The committee consisted of classroom teachers, principals, Title I administrators, and research and evaluation staff. Several existing tests in the domains of speech and story comprehension were considered. Although many of these are fine instruments in their own right, the committee members decided that a new instrument needed to be tailored to the D. C. Title I program needs. In a series of ad hoc and full meetings, the Language Assessment Battery (LAB) was developed. The original version of the LAB consisted of the seven sections shown in Table 14.2.

TABLE 14.2 ORIGINAL SECTIONS OF THE LANGUAGE ASSESSMENT BATTERY

Section	Number of Items	Estimated Time
Sounds or Environment Stimuli	17	10 minutes
Scariest Thing	1	5 minutes
Symbols		
a. Pictorial Symbols	26	5 minutes
b. Physical Symbols or Gestures	15	5 minutes
Story Comprehension	6	5 minutes
Picture Stories	3	15 minutes
Words Beginning with the Letter "M"	1	30 seconds
Small Group Interaction	1	5 minutes

The "Sounds" section was a tape with 17 environmental sounds, such as a rooster crowing, sirens wailing, and water running. The student was to respond to these stimuli by naming the object making the sound. The "Scariest Thing" section provided an opportunity for the students to tell about the scariest things that had ever happened to them; it was hoped that this section would facilitate rapport between the test administrator and the student and put the student at ease. The "Symbols" section contained both pictures (such as a symbol for a handicapped person) and gestures (such as an "ok" signal). Common to the experiences of the students, these pictures and gestures were entirely recognizable to them. The students were able either to tell what was symbolized or to describe the thing represented.

In the "Story Comprehension" section, a short story was read aloud on a prerecorded tape, and the students were asked several simple questions about the narrative that they had heard. This portion of the test was designed to assess how well the students listened to orally communicated tales. The "Picture Stories" section consisted of three photographs of children in various situations. The students were to tell a story about each photograph to test their abilities to conceptualize and communicate ideas. In the "M Words" section, the students were given 30 seconds to say all the words they could recall which began with the letter *M*. The final section brought students together in pairs to elicit peer-to-peer communications; the purpose was to determine whether language facility differences existed in peer relationships as opposed to student-to-tester relationships.

These LAB sections were ordered to give the students confidence and to put them at ease in a strange situation with an unfamiliar adult present. The ordering was as follows: "Sounds;" "Scariest Thing;" "Picture Stories;" "Story Comprehension;" "Pictorial Symbols;" "Physical Symbols;" and "Words Beginning with *M*." The "Small Group Interaction" was obtained at the end of a testing session with one student and just prior to the testing of the next student. Then these two students were brought together in the presence of the test administrator and were encouraged to speak with each other and to role play: one child was a patient getting a vaccination or shot from the other child, a doctor or nurse.

In addition to right and wrong answers on several LAB sections, four checklists (Appendix A) were used to assess speech samples of the students. Two of these were derived from a language facility test developed by Dr. John Dailey and used in the District of Columbia about 10 years ago to assess (1) deviations from mainstream or standard English and (2) abilities to conceptualize and communicate ideas. A third checklist was developed by Dr. Juanita Fletcher, consultant to the Title I evaluation; it addressed the quality of speech. The fourth checklist focused on environmental and behavorial characteristics during the testing.

PILOT TESTING AND REVISION OF THE LAB

Three senior speech students from the University of the District of Columbia were recruited to administer the pilot LAB to five students each. The primary criterion for selection was familiarity with speech characteristics and sensitivity to speech deviations. Each administrator was supplied with a copy of the LAB, an answersheet, a scoring manual, an administration manual, and answersheets for the students to be tested. During the training session for the administrators, several improvements were made on the pilot version of the LAB, and further suggestions were given which were taken later. It was decided that a tape recorder would be used to gather speech samples from the students to facilitate accurate scoring as well as to administer the "Sounds" and the "Story Comprehension" sections of the LAB.

As with most testing, unforeseen difficulties caused disappointments. Scheduling errors kept one administrator from testing the 5 students assigned; therefore, 10 instead of 15 students were tested with the pilot LAB. Half of those examined were Title I and the other half were non-Title I students. The sample of students was drawn randomly from Title I schools by the chairman of the Language Assessment Committee.

DEBRIEFING OF TEST ADMINISTRATORS

Valuable information and lucid insights contributed at the training session by the seven testers merit attention, apart from their relationships to the empirical analyses of the LAB administration results. One unanimously expressed comment referred to the poor quality of the sounds on the prerecorded tapes--namely, some of the sounds were unclear and indistinguishable. Too much noise between the sounds and distracting beeps or cues for the next sounds shortened the student's attention span, and some of the pauses between the stimuli on the "Sounds" section could be eliminated.

Despite these criticisms, the testers seemed to agree that none of the children were bored with the test: "They were constantly into it." Two of the most popular items among the children were in the "Sounds" section. The last sound was a strange concoction of beeps and whirs often interpreted as a space ship or conglomeration of noises from outer space, and another popular sound was a lady laughing.

Several things became evident later when the results were analyzed. First, the LAB was too long; several students found it difficult to focus their attention for the 45 to 50 minutes required to finish the test. Second, the quality of some of the tapes was poor so not all of the sounds were clearly distinguishable. Third, some of the sounds and some of the symbols were not familiar to the students; this had been expected so an overabundance of items had been included, knowing some would be deleted later.

The purpose of the assessment, to reiterate, was to get a snapshot of the student's ability to understand and use language, although the usage may not be standard or mainstream. Dialect was not only perfectly acceptable, differences were expected between mainstream and dialectal usages in terms of facility, conceptualization, and expressiveness.

From the pilot testing, important revisions were made in the LAB. Two sections were dropped from the test completely: the "Scariest Thing" and the "Small Group Interaction" were deleted primarily due to time constraints. The selection used in the "Story Comprehension" section was replaced with one chosen by a Title I program staff member. The story initially used was rather confusing, somewhat long, and irrelevant to students' experiences. The "Pictorial and Physical Symbols" sections were shortened to 16 and 10 items, respectively. The "Sounds" section was abbreviated to 11 items. Separate sets of pictorial symbols and photographs for the "Picture Stories" section were produced in sufficient quantity for the upcoming field testing of the revised LAB (Appendix A). Prerecorded tapes were copied for the new "Sounds" and "Story Comprehension" stimuli.

TRAINING OF TESTERS AND THE ADMINISTRATION OF THE LAB

An attempt was made to recruit a minimum of 10 testers and to include the original three who were skilled in detecting speech differences and in administering the tests. Two of the original testers and five new testers were selected. A training session was held for these seven, using the revised LAB. Members of the Title I program staff and the research and evaluation staff as well as the consultant to the evaluation project attended and contributed their experiences. Each tester received a revised LAB instrument, an administration manual, a scoring manual, a sample answersheet, a set of "Pictorial Symbols," a set of photographs for the "Picture Story" section, a prerecorded tape containing the "Sounds" and "Story Comprehension" stimuli, and a sufficient quantity of answersheets for a minimum of 40 students each.

The sample for the field test was selected by the chairman of the Language Assessment Committee. A total of 30 Title I schools was selected, from which 7 to 20 Title I and non-Title I students were tested on 6 consecutive days. Each tester interviewed from 35 to 50 students in that 6-day period. The efforts of the testers were coordinated with those of the teams administering the Conservation Assessment Package (CAP) and the Physical Fitness Survey (PFS). A total of 229 students was tested using the revised LAB.

Not only the children but also the testers enjoyed participating in the LAB. The testers commented that it was varied in item or stimulus format and in the range of allowable answers and answer formats. Sometimes a one-word answer was sufficient; other times, an elaborate story was required. The testers felt that it was almost as much fun to give the test as it was for the students to take it.

The average time needed to complete the test with any given student was 20 minutes. With a slow child, some of the examiners took as long as 30 minutes. Many of them commented that the LAB was much better than a pencil-paper test because the LAB involved the students more and held their attention and interest longer than expected for children in the first through the third grades. The LAB test items were also described as less ambiguous than those on many standardized achievement tests.

One procedural oversight was the failure to use a checklist to elicit opinions about the tests from the students. Some of the testers informally obtained reactions by asking the students what they thought. Formally assessing this sort of opinion could have been useful in revising the test for use next year.

As a rule, the testers wanted to prompt the students to help them verbalize their responses to the test stimuli. Many of the testers and some of the Title I program staff thought that prompting would have elicited richer and, in some cases, more accurate responses. The primary rationale for requiring that the testers refrain from prompting the students involved standardization. That is, it is difficult to standardize test administration behavior, such as prompting, to the point that some students do not receive a greater benefit from the prompting because one test administrator is more effective than the others. To be as fair as possible to all students, it is easier to restrict prompting than it is to train the test administrators to prompt with equal vigor and originality.

Some of the testers identified handicaps or impediments, such as learning disabilities; flagged the answersheets for these students; and notified the Title I coordinators in the schools. In contrast, many testers stated that most of the students they tested appeared to be very bright, despite the fact that their achievement test scores indicated a need for Title I services. This could be subjective evidence supporting the idea that some students receive Title I services because they do not perform to capacity on the selection instruments and criteria used to designate Title I program participants.

Some students were frightened or ashamed to say "I don't know," when they could not answer some of the LAB items. It was an oversight not to include instructions which could have helped the learners to feel comfortable with admitting that they did not know. This recommendation and others related to test materials and instructions are included in this chapter.

All testers stated that they would prefer having a partner in the testing situation. The format of the tests would then be altered slightly so that one could administer the test while the other dealt with the answersheet and perhaps the recording equipment. None of the testers thought that the presence of another tester would be distracting; it had not been distracting when another individual participated in the testing situation, but when an individual was not participating, this presence seemed to be extremely distracting to the students.

Standardized tests can require that the administrator be somewhat of a juggler and clown. The tester may be required to present cards and items to the children for their responses while simultaneously scoring their answers on an answersheet, and to keep close track of response time on a stopwatch while providing an entertaining, nonthreatening atmosphere that will achieve rapport, cooperation, and interest. Psychologists who are practiced in the administration of the Stanford-Binet, the Wechsler Intelligence Scale for Children, and other similar tests require extreme skills to accomplish these tasks. As long as the second individual involved in the testing and administration is unobtrusive, straightforward, and helpful, the recommendation of a two-member team to administer the LAB seems appropriate.

Other criticisms of the LAB administration involved the scheduling of the testing space and use of one of the scoring checklists. The testers complained that they and the children were often placed "anywhere they had room" to put them in the school; thus, some environmental problems might be expected to surface in the results of the data from the testing. Future administrations of the LAB should ensure a quiet, secluded, comfortable place. This may be a problem more of scheduling than of building space.

The testers as well as the Title I program staff and the consultant to the evaluation project seemed to agree that the checklist scoring system for deviations from mainstream or standard English was insufficient, dated, and unacceptable for current and future D.C. usage. The group recommended that a replacement scoring system should be developed to address more specifically the speech characteristics prevalent in metropolitan or "big city" environments before the next administration of the LAB. The scoring system used in this field testing for the LAB seemed somewhat biased towards southern rural environments. A recommendation relating to this criticism is in this chapter.

Finally, an intriguing fact surfaced during the discussion of the students' tendencies to repond on a literal or concrete level, as opposed to an abstract or interpretive level. Students tended to describe pictures and symbols (both physical and pictorial) rather than to interpret their meanings. With prompting, the meaning could sometimes be elicited. For example on the "Physical" symbols item where the test administrator sticks out her tongue at the child, the students often said that the administrator was sticking her tongue out," but with prompting, the student would define the meaning as "I don't like you," or "you're naughty," or "you're bad." In other words, the interpretations seemed more concrete than abstract. One reason for this result may be the picture-reading activities commonly used in the D.C. classrooms. If the students are used to "reading pictures"--describing them literally, giving piecemeal definitions of what they see in the picture--rather than supplying Gestalt or wholistic analyses of the pictures, then the students may be expected to describe photographs of children in various activity situations rather than to tell stories about what is happening, why it is happening, and what will result from it.

The Title I and the non-Title I participants in this field testing might be quite capable of responding on abstract levels. The focus of part of the classroom instruction might be shifted from literal and concrete to abstract and interpretive to elicit the desired responses.

The students tested generally seemed unwilling to venture into the abstract in responding to the picture stories, the physical symbols, and the pictorial symbols. When they did respond, they seemed to prefer their own interpretations of academic speech patterns through strong forms of speech. The tendency to literal responses to the pictures and the gestures is likely interrelated with the classroom picture reading; this possibly merits investigation, and it may suggest new emphases for curriculum development in the Title I program.

RESULTS OF THE FIELD TEST

To follow this discussion of two major topics--results from the analyses suggesting instrument revisions and potential program implications--it might be helpful for the reader to refer to the test instrument and the scoring manual (Appendix A).

Results Analyzed by Item

Not all of the LAB sections were scored in the same way. On the "Sounds," "Story Comprehension," and "Physical Symbols" sections, correctness depended on the accuracy of the responses, since each item in these three sections had only one correct answer. In the "Pictorial Symbols" section, each response was correct if it indicated that the student recognized the object or idea symbolized by the picture stimulus. (Simply describing or naming the picture was not judged "correct.") The "M-Words" section was scored by the number of nonidentical words the student named in 30 seconds.

The "Picture Story" section was scored according to two systems (see page 2 in this chapter). The first system was scored by the degree of conceptualization and communication of ideas expressed in the response; this system ranged from 0 to 9, with 9 being the highest score (Table 14.3 describes ability levels corresponding to each score value). The other tallied the deviations from mainstream English in the students' free speech. Deviation scores consisted of the number of times each of 23 characteristics was noted by the test administrator.

TABLE 14.3: ABILITY LEVELS CORRESPONDING TO SCORE VALUES FOR THE DEGREE OF CONCEPTUALIZATION AND COMMUNICATION IN THE PICTURE STORY SECTION OF THE LAB

Score Values	Corresponding Ability Level as Defined by Response Characteristics
0	No verbal score, or incomprehensible response.
1	Single noun description.
2	Descriptions comprised of more than one, single noun response, but not a complete sentence.
3	Any complete sentence description.
4	Descriptions comprised of two or more complete sentences, but with no mention of movement, action, or interaction.
5	Descriptions comprised of two or more complete sentences with some reference to movement, action, or interaction, but not in great detail.
6	Detailed descriptions referring to movement, action, or interaction, but with no reference to future actions or implications.
7	Detailed descriptions encompassing movement, action, or interaction with references to future actions or implications, but not a complete story.
8	Descriptions consisting of a complete story, but not well-organized and possibly lacking imagination and creativity.
9	Complete, well-organized story displaying imagination and creativity.

Keeping in mind differences in scoring, one may view the percentages by item and by section in Table 14.4 for the "Sounds," "Story Comprehension," "Pictorial Symbols," and "Physical Symbols" sections of the LAB. Represented are the percentages of students who answered each item "correctly;" discrepancies in response strengths are analyzed separately herein.

Table 14.4 Percentages of "Correct" Responses by Item on Four Sections of the KAB

Item Number	LAB Section			
	Environmental Sounds	Story Comprehension	Pictorial Symbols	Physical Symbols
1	92.6	64.6	84.7	99.1
2	23.6	73.4	58.5	87.8
3	76.4	51.1	77.3	65.9
4	71.2	34.5	52.4	99.1
5	90.8	32.8	95.6	76.4
6	11.4	33.6	81.1	88.6
7	93.0		85.6	83.8
8	91.7		60.7	86.5
9	88.6		73.8	90.0
10	53.3		96.9	94.8
11	60.3*		51.5	
12			78.2	
13			51.0	
14			16.2	
15			64.2	
16			81.6	

*Any response related to outer space or weirdness was rated a "right" answer, although it is the author's opinion that there is no "right" answer to this item; any response would be acceptable.

Sounds Section. Item 2 and 6, the least frequently recognized by the students, were the sounds of an auto collision and glass breaking. Most likely, the fault was the poor quality of the tape, since these two were recognized frequently enough during the pilot test to justify inclusion in the LAB. Item 10, the crowing of a rooster, was somewhat unfamiliar to the students, even after identification by the test administrator. This item may either be dropped from the LAB due to its lack of familiarity, or it may be retained as an informal measure of experience outside the inner city environment.

As expected, sounds such as wailing sirens, a giggling lady, and a barking dog were recognizable to most students. This fact is documented by the percentages of items 1 (dog barking), 5 (bells ringing), 7 (lady laughing), 8 (car horn), and 9 (siren) in Table 14.4. Interestingly, 60.3 percent of the students correctly identified item 11 with outer space or weirdness. (The scoring instructions were to award a "correct" rating to any response pertaining to outer space, flying saucers, space ships, or weird/bizarre things.) That such a large percentage of students recognized the auditory symbol for

something strange or unknown is strong support for Marshall McLuhan's thesis that "the medium is the message." (People of all ages in this society, not just children, are conditioned by the media.) Auditory vehicles such as television, radio, and films teach listeners to anticipate consequences after having heard specific "introductory sounds." Some sounds are scary, some are romantic, and some are hostile and threatening. At the early ages (6-8 years) represented by this sample, children responded to bizarre, eerie computer-simulated noises. The strength of this message--conditioned responses are elicited from certain auditory stimuli--needs to be considered by the professional educator in constructing curricula and exercises. Certain stimuli could help the teachers teach lessons which now may be difficult to get across in a more abstract, verbal mode.

Story Comprehension Section. Only item 2 (definition of the word "goose") had a large frequency of correct responses. The fault is mainly the selection of the story. The LAB committee had difficulty in choosing an appropriate story for the designs of the instrument. The selection needs to be brief, easily read, and uncomplicated in content and purpose, and it must provoke questions which assess the students' power of comprehension. Coauthors of the instrument have decided that the story must be replaced. One suggested substitute is an Aesop fable. However, no final decision has been made.

Although the story was not well chosen and the tape was of poor quality, a sizeable portion of students *did* listen attentively and respond correctly to the questions. The last two items, in particular, addressed vocabulary used in the story.

Pictorial Symbols Section. On the whole, the students did very well with this section of the LAB. Surprisingly, item 14 (the bicentennial emblem) failed to elicit a correct response with great frequency; children in the Nation's capital failed to recognize the bicentennial emblem. Maybe the meaning of this symbol was never explained. The importance of visual symbolism is addressed below.

Moderate (below 0.60) response frequencies were recorded for items 2 (Red Cross), 4 (emblem for the Metro, the D.C. subway system), 11 (school crossing sign), and 13 (bicycle crossing sign). The Red Cross symbol may be the victim of time--no longer is it commonly seen on ambulances, nurse's uniforms, or hospitals; today it is associated mostly with blood banks and the Red Cross organization itself. Perhaps the Red Cross is now more actively involved in foreign countries than it is in the day-to-day operations of U.S. doctors, nurses, and hospitals. Ambulance sirens; professional insignias, such as the medic's shield; and international signs, such as the "H" for denoting a hospital zone have replaced the once familiar Red Cross.

The anomalous result was the apparent lack of familiarity with the Metro emblem. Perhaps because the subway system is relatively new, not many students have been exposed to it; however, the subway can provide a unique opportunity for an educational experience in a brief field trip or a rather elaborate transportation lesson could be designed with the Metro to include both the subway and the busline. This symbol is context specific, in that it would have no meaning outside of the D.C. metropolitan area. If the LAB were to be used nationally, the Metro emblem would likely be replaced with a bus stop sign, railroad crossing sign, or some other transportation-related symbol.

Surprisingly, two items, the school crossing and bicycle crossing signs, were not extremely familiar to the students. This could be due to the reliance upon traffic police and school patrols to the exclusion of signs; it could be due to lack of either bicycles or bike paths in the inner city; or it could be that the students become so accustomed to such signs that they do not notice them. Teachers might incorporate a signs lesson in their classes to ensure recognition which could be important to traffic safety.

In contrast to the five rarely recognized items (especially the bicentennial emblem), notice the familiarity of items 5 and 10--McDonald's golden arches and a telephone symbol. The frequency with which these symbols are seen by Americans ensures recognition of the things symbolized by them. The McDonald's trademark often symbolizes positive entertaining reinforcement such as clowns and funny advertisements; free goodies in the form of toys like balloons, calendars, and cartoon glasses; tasty treats; and birthday party facilities. If professional educators were to use this paradigm--a

symbol followed by appealing consequences or "rewards"--then instructional classroom strategies could be greatly facilitated. For example, an individual's grammatical speech patterns can be conceptualized as a structured template to determine how language is used by the individual. The speech patterns or "grammatical templates" of inner city children could be more easily modified by teaching the rules of grammar through games rather than by rote memorization. During the 1950s, the spelling of "encyclopedia" was taught to millions of young television viewers by Walt Disney's Jiminy Cricket singing a little jingle which spelled out the word in a rhythm easy to remember. Similarly, many correct usages of speech could be indelibly imprinted on the students' language templates through jingles, rhymes, and games which model the appropriate usages.

Physical Symbols Section. The students did especially well on this section of the LAB. Item 3 (the "OK" sign) was the least commonly recognized, but 66 percent of the students recognized it. (Maybe the "OK" gesture is more common to adults than to children.) The primary recommendation is to include two commonly used gestures of the inner city environment--the signs for "Solid!" and "Give me five!" are physical symbols more common to the students than the OK sign.

Picture Stories Section. The last three items in this section were used only if a student failed to respond to the first three items. Less than 1 percent required these last three, so items 4 through 6 are disregarded in this discussion. Table 14.5 displays the percentages of students obtaining each possible score on items 1, 2, and 3; Figure 14.1 depicts the distribution of the scores. The responses on these three items are generally normally distributed with a fairly low percentage of students scoring zero on each one. It is not surprising that the scores are distributed normally, since many such scores awarded on educational tests have a similar distribution. Of great interest, however, are the qualitative characteristics of the speech samples collected (as discussed earlier, in "Debriefing the Test Administrators"). The students seemed to be describing rather than interpreting the photographs; in fact, prompting from the testers was often required before interpretive answers were given. This will be addressed further in the next section on implications for programmatic change along with the last two LAB sections--the Behavioral Checklist and the Fletcher Checklist.

Table 14.5 Percentages of Students Responding to the Picture Stories Items by Scores Received for their Responses

Score Received	Items		
	1	2	3
0	8.7	9.2	12.2
1	0.0	0.0	0.0
2	1.3	1.3	0.9
3	7.4	11.4	11.8
4	12.2	11.4	9.6
5	27.9	27.5	28.4
6	17.0	16.2	14.4
7	13.5	10.5	10.0
8	5.2	7.4	5.7
9	6.6	5.2	7.0

Figure 14.1 Histograms of Items Depicted in Table 14.5

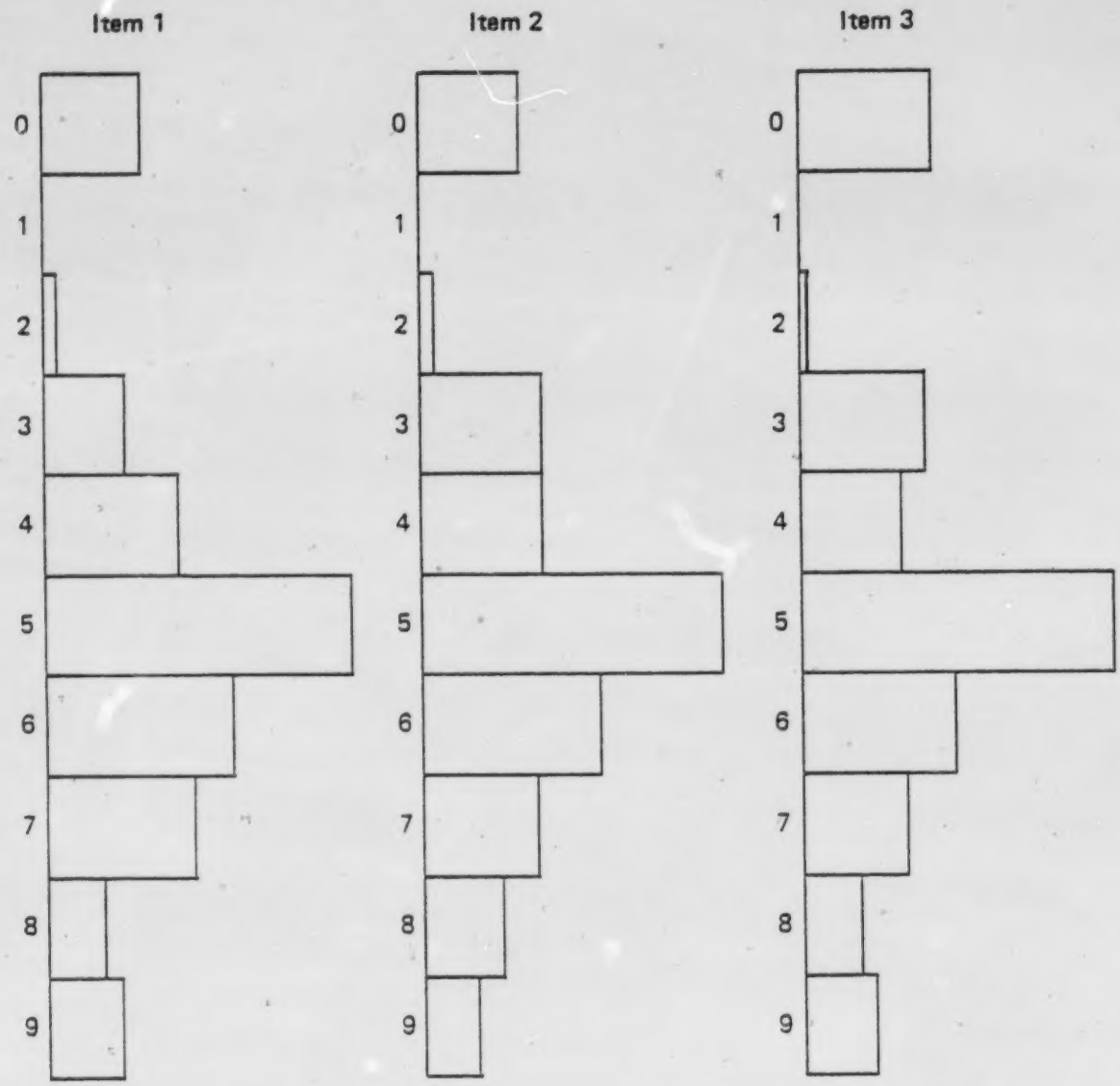


Table 14.6: Analysis of the Field Test Results by Grade and Title I Status for Each Section of the LAB

LAB SECTION	GRADE AND TITLE I STATUS						RANGE FOR SCORES
	1		2		3		
	TITLE I (N=34)	NON-TITLE I (N=35)	TITLE I (N=42)	NON-TITLE I (N=27)	TITLE I (N=43)	NON-TITLE I (N=38)	
Environmental Sounds							
$\bar{X}$	6.15	6.57	6.79	7.07	7.23	7.53	0–9
S.D.	2.55	2.69	2.23	1.49	1.59	2.02	
Story Comprehension							
$\bar{X}$	2.18	2.49	2.79	3.37	2.86 •	4.00 •	0–6
S.D.	1.88	2.23	1.84	1.94	1.83	1.95	
Pictorial Symbols							
$\bar{X}$	10.74	9.83	10.81	11.0	11.67	12.42	0–16
S.D.	2.73	3.17	2.45	3.44	3.02	2.70	
Physical Symbols (Gestures)							
$\bar{X}$	8.56	8.14	8.40	9.11	8.72 •	9.39 •	0–10
S.D.	1.74	1.93	2.11	1.37	1.47	0.86	
"M" Words							
$\bar{X}$	6.06	5.54	5.62	6.27	5.95 •	8.08 •	0 and above
S.D.	6.00	4.05	2.62	2.78	2.47	3.60	
Picture Stories – Degree of Conceptualization and Communication							
$\bar{X}$	4.61	4.57	4.86	5.45	5.04	5.84	0–27
S.D.	2.20	2.14	2.15	2.10	1.74	2.08	
Behavioral Checklist							
• Attentiveness							
$\bar{X}$	0.05	0.05	0.05	0.03	0.05	0.03	0–9
S.D.	0.11	0.10	0.09	0.08	0.11	0.05	
• Facial Responses							
$\bar{X}$	0.18	0.19	0.19	0.24	0.19	0.18	0–3
S.D.	0.17	0.17	0.19	0.15	0.16	0.17	
• Obvious Speech Variables							
$\bar{X}$	0	0.03	0	0.02	0.03	0.03	0–2
S.D.	0	0.17	0	0.96	0.13	0.11	
• Environmental Considerations							
$\bar{X}$	0.47	0.45	0.44	0.53	0.49	0.54	0–5
S.D.	0.28	0.26	0.24	0.25	0.21	0.26	
Fletcher Checklist							
• Overall Rating							
$\bar{X}$	2.63	2.51	2.71	3.07	2.90	3.07	2–10
S.D.	1.32	1.47	1.23	1.20	0.97	1.05	
• Command of Language							
$\bar{X}$	2.53	2.52	2.63	3.11	2.94	3.02	3–15
S.D.	1.24	1.32	1.20	1.21	0.96	1.09	
• Vocal Expression							
$\bar{X}$	2.96	3.09	2.96	3.15	3.46	3.36	4–20
S.D.	1.37	1.56	1.24	1.17	0.95	1.09	
• Articulation							
$\bar{X}$	2.70	2.72	2.78	3.22	3.03	3.09	3–15
S.D.	1.31	1.42	1.22	1.14	0.96	1.06	
• Pronunciation							
$\bar{X}$	2.79	2.80	2.90	3.22	3.16	3.24	1–5
S.D.	1.32	1.45	1.27	1.19	0.95	1.13	
• Rate							
$\bar{X}$	2.82	2.77	2.88	3.19	3.23	3.18	1–5
S.D.	1.31	1.42	1.18	1.14	0.92	1.06	
• Phrasing							
$\bar{X}$	2.74	2.74	2.79	3.16	3.07	3.03	1–5
S.D.	1.31	1.40	1.20	1.10	1.03	1.08	
• Body Expression							
$\bar{X}$	2.93	3.01	2.98	3.33	3.10	3.33	6–30
S.D.	1.33	1.53	1.19	1.17	1.08	1.12	

*These Title I vs. non-Title I differences are statistically significant at a confidence level of at least 0.99.

Analysis and Implications of Results

In Table 14.6, most noticeable is the similarity between the Title I and the non-Title I averages for the Behavioral and Fletcher Checklists items. The second grade sample, however, seems to be an exception with the Fletcher items; here the differences range from 0.19 to 0.48, with a mean of 35.13 and a median of 36. The second grade sample was judged to have slightly different speech patterns

with respect to Title I status than the samples for the other two grade levels. It is also interesting that the standard deviations for the Title I and the non-Title I groups seem to decrease with each successive grade level on the Fletcher Checklist sections.

The Behavioral Checklist seems to maintain the same standard deviations across grade levels, so no clear patterns can be observed in the first five sections for this characteristic. This Checklist merely describes the testing environment and the student's responses as observed by the test administrator. The low averages on "Attentiveness" imply little trouble paying attention to the test administrator and to the test tasks. For "Facial Responses" to the test, an earlier item analysis showed that 2.8 percent registered disgust; 4.2 percent, lack of understanding; and 54.5 percent, delight with the test items. The extremely low averages for the "Obvious Speech Variables" denote the negligible frequency of problems such as stuttering or lisping. Finally, the averages on the "Environmental Considerations" reveal that the testing environments were not always conducive to success; apparently, a very high proportion of students was tested in spite of distracting extraneous sounds such as sirens, and distracting movements such as people passing in and out of the room. These criticisms noted by the test administrators need to be considered in the next LAB testing to promote as successful an experience as possible for the students.

The Fletcher Checklist was devised for recording scores for verbal and nonverbal speech performances of Title I and non-Title I children. The checklist suggested the assessment of specific speech characteristics in broad categories: "Overall Rating," "Command of Language," "Vocal Expression," "Articulation," "Pronunciation," "Rate," "Phrasing," and "Body Expression." LAB data indicate that there were essentially no differences in the scores of Title I and non-Title I children in overall speech performances in grade 1. Indeed, the scores for Title I children remained static for all three grades; the scores of non-Title I children showed growth between grades 1 and 2 but remained static for grade 3.

The same pattern of scores for grade 1 was evident in each of the other categories except "Vocal Expression" and "Body Expression." In these for grades 1 and 2, Title I children scored significantly lower than non-Title I children. For grade 3, the scores of the two groups were essentially the same. In all other speech quality categories, Title I children showed no growth between grades 1 and 2 but comparable growth on the same level as non-Title I children in grade 3.

Little or no variation in speech patterns may safely be expected among ethnic group members who live in the same social environment, since speech is imitative and since people of certain regions, areas, and districts share the same speech patterns. This is true of the dialect evidenced in the nonstandard speech of many Black Americans of lower socioeconomic levels. Regional differences do exist in speech; however, according to recent studies, distinctive dialectal patterns in articulation, syntax, and stress are invariably present in Black speech regardless of the region. Rural areas or urban centers (such as New York, Chicago, Los Angeles, and Washington, D.C.) have dialectal differences in speech patterns (Anastasi and DiAngelo, 1972; Labov, 1964; McDavid, 1968; Stewart, 1974); except with special help, nonstandard dialectal patterns and syntax usually persist in some form into adulthood. The similarities in scores for articulation between Title I and non-Title I children may be attributed to the fact that all those tested in both groups were Black Americans living in the same neighborhoods, attending the same schools, and sharing similar backgrounds and social experiences.

The scores showing no growth for Title I children from grades 1 through 3 may be indications of persistent patterns associated with immaturity in the use of verbiage--not so much in articulation but in the command of language, which includes the ability to judge sentence length and structure as well as word selection. (These aspects of language are usually the surest indices of language maturity in the early years.) Lack of variance may signal the need to construct an instrument for deeper investigation into the Title I child's oral language skills. At any rate, the data do indicate a need for Title I children to have frequent opportunities to develop freer and more complex linguistic facility.

Averages of the Fletcher Checklist range from 1 to 5. All averages for both groups at all grade levels ranged from 2.51 to 3.46, so it seems that the students were judged as "average" by the test administrators on the various sections of the checklist, Negligible differences exist between Title I

and non-Title I groups on all items except those for the second grade sample. Statistical t-tests were run for all sections of the Fletcher Checklist at each grade level. These compared Title I and non-Title I averages, but none of the differences between groups were statistically significant at any of the three grade levels. There seem to be negligible differences between the Title I and non-Title I students in the sample, with respect to speech quality.

Figure 14.2 Differences Between Title I and Non-Title I Students on Six Sections of the LAB in Raw Score Metric Across Grades 1, 2, and 3

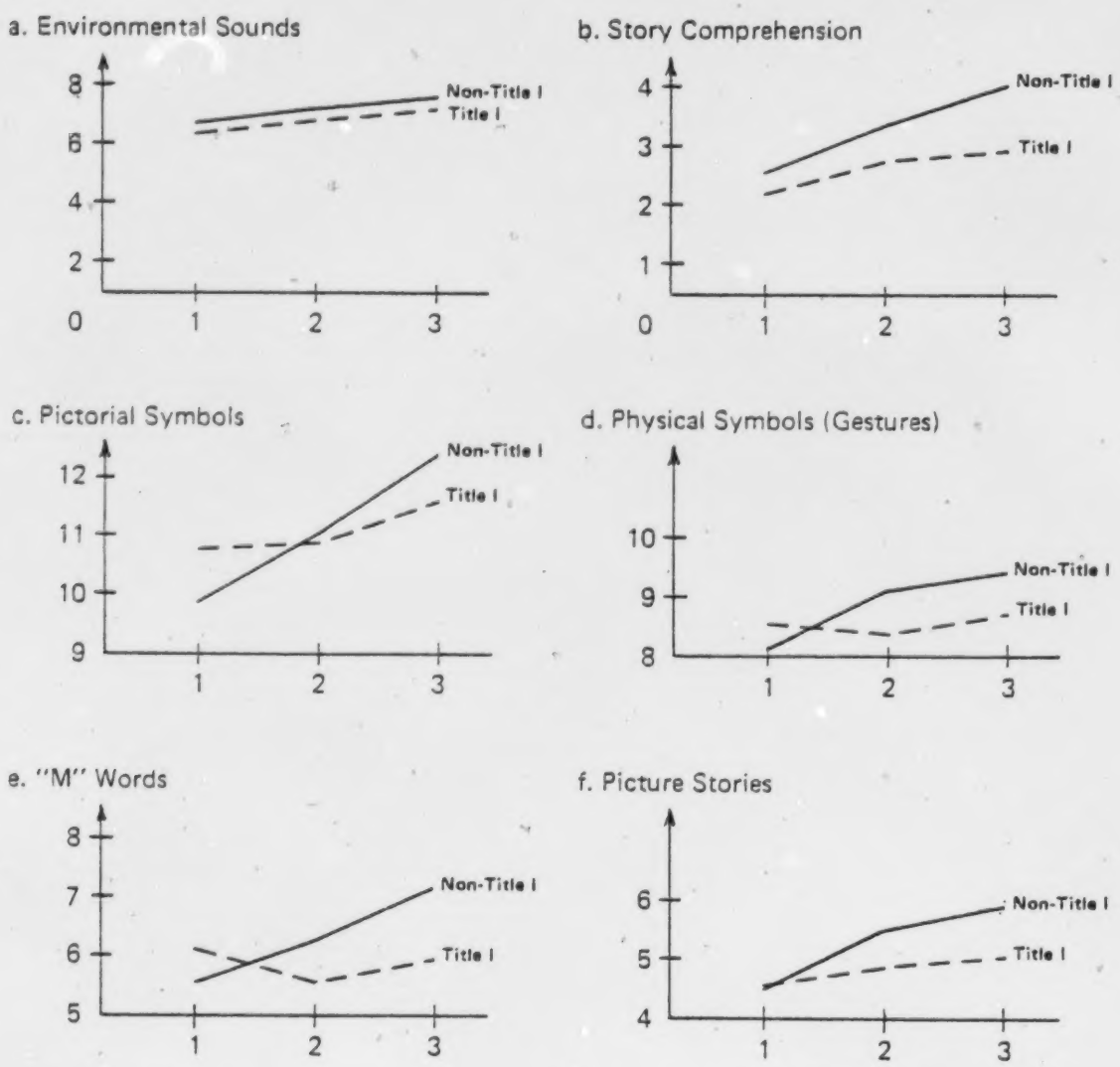
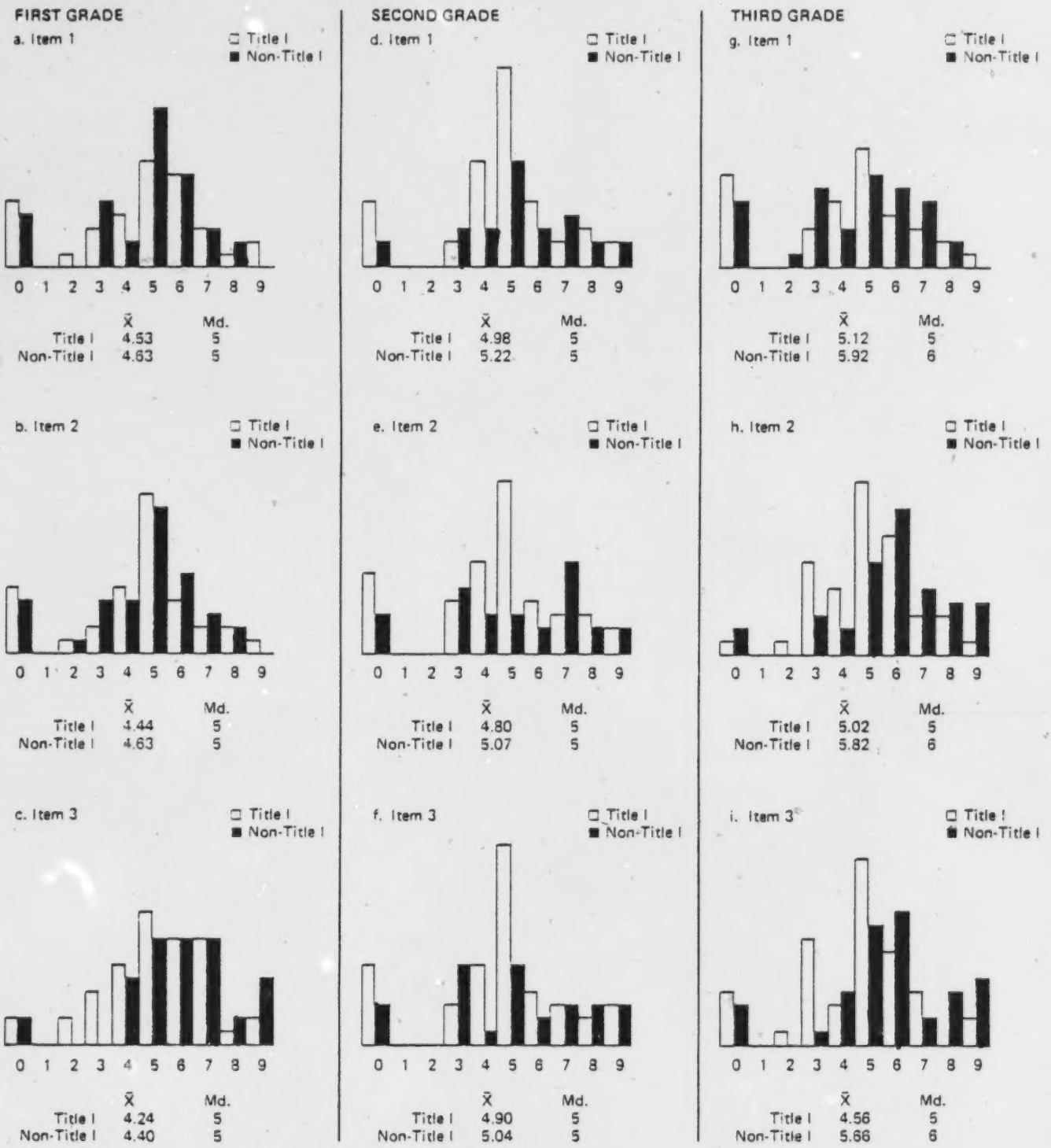


Figure 14.2 displays the differences between Title I and non-Title I students at each grade level for the first six LAB sections. It is interesting that on two sections, "Sounds" and "Story Comprehension," the same tendencies are observed as with the CTBS achievement scores--that is, the non-Title I students are slightly ahead of the Title I students and remain ahead through grade three. In fact, the disparity between the two groups begins to widen on the "Story Comprehension" section as grade level increases. However, the "Story Comprehension" section of the LAB was severely criticized, so these results are merely suggestive.

Figure 14.3 Histograms of Item Responses for the Picture Story Section of the LAB by Grade Level and Title I Status



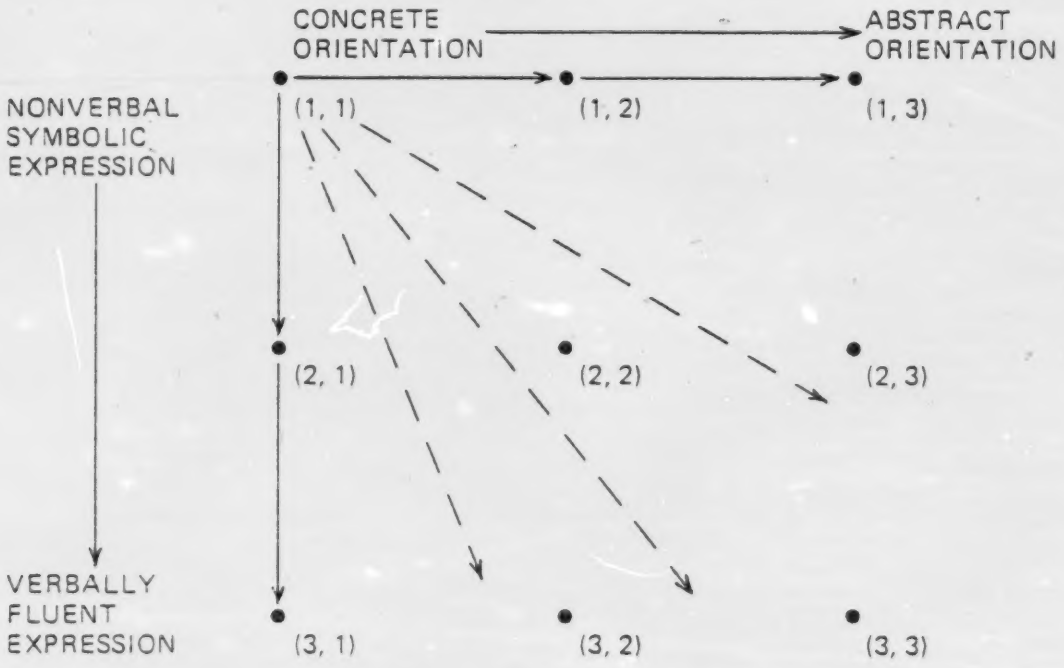
On the other four LAB sections, the Title I students begin ahead of non-Title I students, then lose their lead in second grade, and finally fall behind non-Title I students by the end of the third grade. The vocabulary divergence noted in Figure 14.2 exemplifies this trend. Statistical t-tests run on the

differences between Title I and non-Title I average scores for each grade level showed differences that were statistically significant at grade three for the "Story Comprehension" ($p = 0.009$), "Physical Symbols" ($p = 0.013$), and "M-Words" ($p = 0.004$). These emerging differences in the third grade between Title I and non-Title I students on this scale can also be seen in Figure 14.3 (c, f, i), which depicts the histograms of responses to this scale for third graders; the medians for non-Title I students are higher than those for Title I students. Next year it will be interesting to test the significance of these differences with a larger sample, and it is likely that the differences between Title I and non-Title I for this scale will be statistically significant at the third grade level.

Lack of differences in speech measured by the Fletcher Checklist coupled with the increasing disparity between Title I and non-Title I scores leads to an intriguing hypothesis: perhaps the Title I children could perform equally as well as non-Title I children on nonverbal tasks, if not for the depressing effect of something happening during the experiences of the early school years. Results with the Fletcher Checklist portray the Title I students as communicating well for their ages. They are enthusiastic, maintain good body expression, and possess average fluency and clarity in speech abilities. They have no preponderance of immature dialect; they demonstrate average maturity in speech patterns, reveal psychologically healthy self-concepts, and have coherent well-organized ideas. These results contrast with the fact that they as a group lacked alacrity in responding to abstract terms; their responses to content were concrete.

The responses of Title I and non-Title I children were reportedly couched stiffly in their own classroom versions of "formal, academic language." The responses were literal "readings" of the picture--devoid of creativity, imagination, and free expression. Since language is needed to organize conceptual thinking and since thinking is most often dependent on facility in language, every effort should be made in the classroom to lift the language experiences of the Title I child to a more sophisticated level--away from the exclusive use of the concrete image and toward the use of more complex abstract concepts.

Figure 14.4 Schematic of the Development of Communication Skills Adopted by the District of Columbia Title I Staff



The Title I staff of the D.C. Public Schools wants to incorporate more solidly in its reading program the philosophy behind the graphic representation in Figure 14.4. As they mature, individuals progress from a nonverbal to a verbal mode of communicating. They also progress from literal, concrete-oriented conceptual modes to more interpretive, abstract-oriented modes. It seems that the Title I students are proceeding along the vertical gradient in Figure 14.4 to more verbally fluent modes of expression, but their progress slows as they approach increasingly abstract conceptual modes. It may be that the picture-reading exercises used in the Title I classrooms are encouraging the literal conceptual mode rather than growth towards a more imaginative, creative, interpretive conceptual mode. If this is the case, the focus could be shifted to reinforcing and facilitating abstract interpretive responses. Also pointing towards the classroom for the shift is the popular usage of "academic" speech patterns in responding to the "Picture Story" section of the LAB. These concrete-oriented responses were given in speech patterns typical of a formal classroom seeting. The actual focus, with respect to reading goals, needs to be assessed at the classroom level. The above concepts are ready to be collected in a seminal hypothesis requiring formal statement in operational terms and careful evaluation; this would be an appropriate task for the 1977-78 evaluation.

Table 14.4 Multiple Correlations of Regression Equations Predicting CTBS Total Reading Scores Using LAB Scores

	Multiple R	R Squared	Total Reading Mean Expressed in NCEs
Grade 1, using all LAB sections except Behavioral, Fletcher, and Deviations from Mainstream English Checklists (N=55)	0.577	0.333	49.7
Grade 2, using all Lab sections except Behavioral, Fletcher, and Deviations from Mainstream English Checklists (N=54)	0.653	0.426	40.8
Grade 3, using all LAB sections except Behavioral, Fletcher, and Deviations from Mainstream English Checklists (N=66)	0.724	0.532	41.6
ALL GRADES COMBINED, using all LAB sections except Behavioral, Fletcher, and Deviations from Mainstream English Checklists (N=176)	0.643	0.414	43.9*
ALL GRADES COMBINED, using all sections of the LAB (N=176)	0.676	0.457	43.9*

*These are averaged across all three grades.

In closing, some preliminary results compare the LAB scores with the CTBS reading scores (Table 14.7). The multiple correlations resulting from the regression equations predict the CTBS total reading score using the LAB scores. In all cases except the last, only the first six sections of the LAB were used as predictors; the scores from the three checklists were omitted from the equation. Judging from the last correlations for all grades combined, the checklists are not as highly correlated with the standardized achievement score in reading as the other sections on the LAB are. (This is not surprising for the Behavioral Checklist. It also serves for the Fletcher and Dailey Checklists.) This is another indicator that not all that the students know and can do well is being measured by a standardized achievement test; in this case, the untested areas are speech facility and characteristics.

The correlations in Table 14.7 are sizeable at all three grade levels. With each successive grade level, it seems that reading achievement measured by the CTBS becomes more highly correlated with language facility measured by the LAB. This year although the sample sizes were small, this pilot study suggests new directions for assessing communication ability among Title I students. Next year, more can be said with greater confidence about the relationship between language facility and reading achievement if the sample can be increased to a minimum of 200 students per grade level. The D.C. Title I staff can make effective program modifications based on the results of the attendant analyses.

IMPLICATIONS AND NEW DIRECTIONS

1. The LAB might be used as a crosswalk between student language skills and standardized achievement scores, to ascertain exactly how much communication facility is not being reflected in the standardized test scores. One of the basic rules of testing is that, although a student's score might equal zero, this does not necessarily imply that the person tested is totally void of intellect. It implies only that the set of items included on the test are not in the domain of knowledge of that individual. In other words, more questions in other domains of experience need to be asked of that individual. In other words, more questions in other domains of experience need to be asked to assess knowledge. The LAB asks questions in a domain in which most, if not all, students have direct contact and knowledge. The tentative results of this small pilot study also suggest that the students' experience and knowledge in this particular domain could be more genuinely reflective of their overall performance level than are some of the standardized test scores.
2. The grammatical patterns or templates of the Title I students need to be restructured at an early age, preferably beginning in grade one. Early intervention is needed to model mainstream grammatical structures, thereby altering the speech templates. Exercises such as drills and games could be used to restructure the speech patterns. In this manner, the esoteric cultural template can be progressively replaced by a mainstream template throughout the student's academic career.
3. The process of thinking must be addressed strongly in the classroom. Too often in modern American society, more consideration is given to the product than the process. It seems that children could be exercised in the process of thought and familiarized with different approaches to problem solving appropriate to their age levels. It is important that appropriate labels for objects in the environment be taught. However, the actual processes of analyzing and attacking problems are often left to the upper grade levels, when students are sometimes too deeply entrenched in concrete thought patterns to make the change to abstract thought processes. The tendency to respond concretely in fairly unstructured task situations was noted on the LAB field test in the results to the "Picture Story" section. Perhaps some attention should be given to focusing more forcefully on the process of abstract thinking in classroom instruction.
4. A strong recommendation was made by several members of the test development committee and by several of the test administrators regarding the use of nonparticipating observers in the actual testing situation. The nonparticipating observers should be trained ahead of time to reduce the distraction and tension introduced by their presence.

In general, the nonparticipating observers should communicate that they are partial participants. They must act as if they are partners and *convince* the children that they are helpers. Obvious partici-

pation is recommended, perhaps through something as simple as manipulating the tape recorder. To summarize, it should be remembered at all times that children are small, developing persons. Their feelings and perceptions need to be considered, especially in testing situations where their performance is so crucial and they are frequently feeling vulnerable and anxious.

APPENDIX A

LANGUAGE ASSESSMENT BATTERY ADMINISTRATION MANUAL

GENERAL OUTLINE AND OVERVIEW OF THE LANGUAGE ASSESSMENT BATTERY

Individually Administered Portion

I. Play tape of ENVIRONMENTAL SOUNDS (one sound at a time) for student to identify (11 sounds).

II. Play a tape recording of someone telling a BRIEF STORY. Student listens to tape, then answers questions which test administrator poses.

- A. Vocabulary used in story--brief definitions or description supplied by student for a few words.
- B. Comprehension of subject matter--a few brief questions posed by test administrator designed to assess student's understanding of story.

III. Present common SYMBOLS.

- A. Pictorial symbols--16 symbols which are common to contemporary American society.
- B. Physical symbols--10 gestures which are common to contemporary American society.

IV. Ask student to name all the WORDS he/she can think of which begin with an "M," after the administrator gives the signal to start. Time the student--30 seconds--and tally all words which the student names within the time parameter.

V. Present three PICTURE STIMULI from "Words and Actions: Role Playing Photo Problems for Young Children."

- A. Score using Dailey's scoring system.
  1. Deviation from mainstream English.
  2. Degree of ability to conceptualize and communicate ideas.
- B. Score for speech quality using checklist designed by Dr. Fletcher.

Behavioral Checklist

Tally on BEHAVIORAL CHECKLIST according to behaviors exhibited by student during entire testing situation.

ENVIRONMENTAL SOUNDS (I)

The prerecorded "sounds and story" tape should be on the tape recorder.

Say to the student:

I'm going to play a tape for you of some sounds which I think you've heard before. I want you to listen to each sound and then tell me **what made** that sound, or **what that sound reminds** you of. Are you ready?

Student responds. If "no," first answer any questions the student poses about your instructions. Then say:

Okay. Here's the first sound. Listen carefully. *Switch on the tape and play just the first sound. Then ask:* What was that?

Student responds. Score response on answer sheet. Then say:

Good. Here's the next sound. Listen carefully.

Proceed as with first response. Repeat this instruction for all 11 sounds, one at a time.

Go to the next page.

STORY COMPREHENSION (II)

Say to the student:

Do you like to listen to stories? *Student responds.* I'm going to play a tape of someone reading a story for you. I want you to listen to the story very carefully, because I want to ask you some questions about it. Are you ready?

Student responds. If "no," first answer any questions the student poses about your instructions. Then, say:

All right, let's hear the story then.

Switch on the tape recorder and play the dictated story. After the story is ended, switch off the tape recorder. Say to the student:

Did you like that story? *Student responds.* I really liked that story! Let me ask you a few questions now.

Questions

1. What is a goose?
2. What did the man shoot for dinner?
3. What happened when the man started to carve the cooked goose?
4. What happened to the cooked goose just as the man started to eat it?
5. What does "Carve" mean?
6. What does "pluck" mean?

After all the questions have been answered, go to next page.

PICTORIAL SYMBOLS (III:A)

Say to the student:

We are going to look at some pictures now. Each picture stands for something. I want you to look carefully at each picture and tell me what it stands for.

Present cards 1-15, one at a time, scoring the responses as 3, 2, or 1, according to the scoring system.

After all cards have been shown and responded to, go to the next page.

PHYSICAL SYMBOLS (III:B)

Say to the student:

I am going to give you some signals and I want you to tell me what I mean. Okay? Watch me carefully.

Perform each gesture, one at a time. Be careful not to verbalize before each signal or gesture. Say the following to the student:

What does this mean?

Make the signal or gesture. Child responds. Mark response as correct or incorrect. Repeat the question above and proceed to the next signal or gesture.

Signals and Gestures

1. *Put index finger to lips* **as if** *saying, "Shhh!".*
2. *Cup hand to one ear, slightly cock head to that side and frown slightly* **as if** *saying, "What did you say?" or "Did you hear that?".*
3. *Give the "OK" signal with one hand.*
4. *Give the "come on" sign with one index finger, crooked and motioning.*
5. *Applaud.*
6. *Shake one pointed index finger at the child and frown slightly* **as if** *saying, "You'd better listen to me," or "Don't do that!".*
7. *Grab the child's hand and shake it, wrapping your fingers behind his/her thumb.*
8. *Stick out your tongue,* **as if** *saying, "I don't like you!".*
9. *Hug the child.*
10. *Shrug your shoulders.*

After all gestures have been presented, go to the next page.

WORDS BEGINNING WITH "M" (IV)

Say to the student:

I want to play another little game. You know the letter "M." It has the sound "EMMM," like in "Mommy." Now, when I say "go," I want you to say all the words you can think of which **start** with that "EMMM" sound. Do you understand? *Student responds. Clarify further, if necessary.* Okay; ready? Go! *Click on the stopwatch, or begin timing.*

Student begins naming words. Mark on your checklist each time the student names a word which begins with "M." Do not count repeated words; i.e., if the word "mad" is said more than once, count it only one time.

Stop counting at the end of thirty (30) seconds. Take out the prerecorded tape and insert the student response tape. Go to the next page.

PRESENTATION OF PICTURE STIMULI (V)

It is very important that the following directions be read word-for-word. All four instructions **must** *be given unless the students tell a complete story on the first instruction. When for any reason these instructions have not been followed, the differences should be reported with the results of the test.*

Turn on tape recorder and say:

1 Do you like to hear stories?

Student responds.

2. Could you tell me a story about a picture if I show it to you?

If the answer is "Yes," hand the first picture to the subject and say:

3. Good, tell me a story about this picture.

If the answer is "No," say:

See if you can tell me a story about this picture.

Present the picture. If the respondent tells a complete story, the remaining instructions need not be given. Otherwise, they must be given. Note on the scoring sheet how many times beyond this point the student **had** *to be prompted. If there is no response after 30 seconds, say:*

4. Tell me what you see in the picture.

If response lags and more prompting is needed, then say:

5. What are they doing in the picture?

When further prompting is needed, say:

6. What else can you tell me about the picture?

At the end of this response, present the next two pictures, one at a time, and repeat the EXACT WORDING starting at item 3 above. If respondents ask questions about the pictures, say:

What else can **you** tell me about the picture? You tell **me** about the picture.

Be sure to keep this sheet in front of you when giving the test. Score this section using the Dailey and Fletcher checklists.

After the student has finished responding to the last picture in this section of the test, switch off the tape recorder.

You've done very well with these little games we've played. I had a really good time talking with you. Let's go back to your classroom now.

Return the student to class.

INSTRUCTIONS FOR SCORING THE LANGUAGE ASSESSMENT BATTERY

*SPECIAL NOTE TO TEST ADMINISTRATORS: Both the Fletcher Checklist and the Behavioral Checklist pertain to more than one portion of the test. Use the Behavioral Checklist for the **entire** testing situation. Use the Fletcher Checklist when scoring individual student response on the tapes.

ENVIRONMENTAL SOUNDS (I)

Score any responses as correct which indicate that the student recognizes the sound on the tape as being made by the objects listed below, item by item.

Sound 1: Dog barking
Sound 2: Wreck; collision; accident; brakes screeching
Sound 3: Water; liquid pouring or splashing
Sound 4: Sawing (wood)
Sound 5: Bells; church bells; ringing bells
Sound 6: Glass breaking
Sound 7: Laughter; giggles; person laughing
Sound 8: Horn blowing; car or truck horn
Sound 9: Siren; police car; firetruck; ambulance
Sound 10: Rooster crowing
Sound 11: Outer space; flying saucer; space ship

STORY COMPREHENSION (II)

Score any response as correct which resembles the following answers for each question.

1. Bird, big bird; like a duck or swan
2. Goose
3. Goose sang
4. Other geese stuck feathers in the cooked goose; cooked goose was carried away by other geese; other geese stole the cooked goose; all the geese sang and took the cooked goose away
5. Cut up; cut into something; slice up
6. Pull out; pull off feathers; tear off, tear out

PICTORIAL SYMBOLS (III:A)

Scores will be awarded for response to these items on the following basis:

Score	Characteristics of Response
3	Describes or defines accurately thing symbolized or represented by the picture.
2	Defines or names accurately the object presented in the picture but **does not relate** object to that thing which it symbolizes.
1	Describes the picture but does not define or name the object presented in the picture.
	Gives incorrect name or definition for the object presented in the picture.
	Gives incorrect description or definition for thing symbolized by the picture.

Example: Present card with McDonald's trademark.

Response	Score
"That's the big 'M' at McDonald's!"	3
"Ronald McDonald!"	3
"Hamburgers! Malts!"	3
"A letter 'M'!"	2
"A 'W.' (Turns card upside down)	2
"Bridge."	1
"Dunno."	1
"Mountains."	1
"A Camel."	1
"Something Yellow."	1

Responses Deserving a Score of Three

1. Happy; have a good day
2. Ambulance; blood bank; Red Cross; nurses, doctors, first aid
3. Dollars; money
4. Metro; subway; underground train
5. McDonald's; Ronald McDonald; hamburgers, malts; Egg McMuffin
6. Lady; woman; girl; female; ladies' room
7. Man; gentleman; men's room; male
8. Danger; poison; pirates; beware, be careful
9. Barber; haircuts, shoeshines, shaves
10. Telephone, phone
11. School; school crossing; watch out for children
12. Chicken; Kentucky-Fried chicken
13. Bicycle path; bicycle crossing--NOT JUST BICYLE
14. Bicentennial; 200th birthday; July 4th last year
15. Handicapped person; wheelchair; person who can't walk
16. Redskins; Washington football players; George Allen

PHYSICAL SYMBOLS (III:B)

Score any response as correct which indicates that the student recognizes the intent of each of the gestures.

Gesture 1: Shh; be quiet.
Gesture 2: What did you say? Can't hear you.
Gesture 3: OK.
Gesture 4: Come here.
Gesture 5: I like that; good (applause).
Gesture 6: Don't do that; no, no; you better not.
Gesture 7: Glad to meet you; how do you do.
Gesture 8: I don't like you; bleagh, yuck.
Gesture 9: I like you; good boy/girl.
Gesture 10: I don't know; who cares!

WORDS BEGINNING WITH "M" (IV)

Mark down the number of words beginning with "M" which the student says only once.

SECTION V FROM THE LAB, UTILIZING TWO SCORING SYSTEMS FROM DR. JOHN T. DAILEY'S LANGUAGE FACILITY TEST, COPYRIGHT 1968

PICTURE STORY (V)

The test responses will be recorded on tape, in order to enable scoring by more than one person and according to more than one scoring system. The student should be given a chance to respond to each of the questions about each picture unless he/she scores a top nine score before all questions are asked.

The test is untimed and the student should be given as much time as necessary to collect his/her thoughts and to tell the story. Three pictures should take no more than 10 minutes total for a given student. The test should be given in a setting that is quiet and free from distraction. It is important that no toys or other objects be within reach of the student as the test is given. If a tape recorder is used, it has been found very valuable as part of the warm-up to allow the student to hear a playback of a few seconds of his own speech.

The Pictures

The scenes selected for this administration are taken from a kit, "Words and Actions: Role Playing Photo Problems for Young Children." Each picture was chosen because it was judged as offering ample stimulation for student response.

DAILEY'S SCORING SYSTEM (V:A)

Degree of Ability to Conceptualize and Communicate Ideas

The administrator should score each student's tape. The speech of each student in the responses made to each photograph will be graded according to the following scheme:

0 ... No response--garbled speech, or only pointing at picture.

1 ... One single-noun response.

2 ... Compound responses, two or more words at a time, a single word describing action, or more than one single-noun response.

3 ... A complete sentence that makes sense.

4 ... Two or more sentences describing persons or objects but no verb of action or indication of interaction between a person and an object.

5 ... A partial description consisting of two or more sentences with some description of movement or action as seen in the picture.

6 ... A detailed description of what is happening, but nothing about past or future action or intentions. At level 6 all or nearly all of the elements of the picture will be covered, in contrast to level 5 where only some selected elements will be covered.

7 ... An interpretation of some elements of implied action or intentions, as deduced from or suggested by the picture but not a complete story.

8 ... A complete story, but not a well-organized one.

9 ... A well-organized story with imagination and creativity. Need not be original. May use well-known fictional or historical characters.

If the child does not respond at all to a picture or says that he/she can't see it, he/she should be given one of the alternate pictures and scored on it instead of the original picture. If six pictures fail to elicit any response, other evidence from teachers or parents will need to be appraised to determine whether the lack of response is because of excessive shyness. This is extremely rare, especially among urban children. Each picture should be scored according to the above scale. The total score for the test is the sum of the scores on the three pictures used.

Further Amplifications of the Basic Scoring Scale Definitions

Levels 0, 1, and 2:

If the subject fails to make any response whatsoever, or speaks in an incomprehensible manner, or simply points at the picture, the score would be 0. At level 1, the subject gives a single-noun response. Only one word is used. To receive a 2, the subject must give a compound response of two or more words, give two separate single-noun responses, employ a single word of action, or use a phrase. However, at level 2, the subject need not use a complete sentence. Only responses to the content of the picture can be scored. Anything that is unrelated to the picture should be ignored.

Level 3:

If the subject uses any complete sentence, he should be given credit at level 3 even if it is "I can't tell you anything," or "That's all." However, it must be a complete sentence. If auxiliary verbs are omitted (He riding, she sitting) credit should not be given for a sentence. Sentences may be grossly ungrammatical as long as they are complete ("Dis here a hoss," "He are a man," "They is on bed.") The ability to use a complete sentence is a most important milestone in growth in language maturity. Up to one-third of low socioeconomic first grade children will score fewer than 9 for 3 pictures. However, by grade 3 nearly all such students will be responding consistently to the pictures using complete sentences. Of one group of 689 low socioeconomic urban nine-year-old children, only five failed to respond consistently in complete sentences.

Level 4:

Description of movement or action is used here in the sense that nothing is said about the movement or action seen in the picture. At the 4th level the subject only describes the objects in the picture. He/She must use two or more complete sentences to score 4 or higher.

Levels 5 and 6:

Both of these levels should include a description of the objects and action in the picture being scored, the difference being that the description at level 5 will be only a partial one. The level 6 description should be complete or very nearly complete and cover the major elements of the picture.

Levels 7, 8 and 9:

The essential element here is the existence of a "story." This is defined as something made up about the content of the picture wherein the picture in effect becomes an illustration for the story. At level 7 or higher there must be some past or future action or intentions suggested by the picture but not shown in it. The level 7 response will often include considerable description and may not be a complete story. However,**something must be "made up" about the picture.** Level 9 should contain all the major elements of interpretation of objects and for setting out past or future action or intentions. It should show some imagination and creativity, but it can include well-known fictional or historical characters and need not be original. The story should hang together and not ramble. Everything in it should tie in to the picture and be deduced from it. It need not be very long; a level 9 story may sometimes be fairly short. Level 8 should be reserved for stories that do not qualify for the top score because of weak organization.

In summary, it should always be remembered that vocabulary, grammar, and pronunciation should not be considered when scoring for scale level. A level 9 story could be grossly ungrammatical and from a person not familiar with the correct names for some elements of the pictures. The scale measures facility in the use of the person's own language or dialect and not in mainstream English.

DAILEY'S SCORING SYSTEM (V:B)

Deviation from Mainstream English

The scoring of this section of the test for basic language facility in the child's own dialect or language requires no special training other than a careful study of the scoring directions and examples. However, the scorer should be sure that these are fresh in memory before attempting to score. Reread the scoring directions from time to time. It is assumed that the scorer is familiar with and can understand the language or dialect in which the child's responses are given.

Two persons should score each student's tape using the V:B checklist. A tally mark is made in the far right column each time a given deviation is noted in the student's speech. Transfer the actual number of marks for each of items 1-23 on the checklist to the answer sheet; in section V:B, when finished with Section V of the Language Assessment Battery.

APPENDIX B

Normal Curve Equivalents

Any national assessment of program impact requires that the data from the numerous projects being evaluated be comparable. Typically, local education agencies enjoy generous autonomy in the selection of objectives, evaluation methodology, and instrumentation. Hence, the major logistical difficulty for a national evaluation team resides in aggregating various types of scores derived from different tests.

The normal curve equivalent (NCE) presents one solution to this dilemma. Two basic assumptions must, however, be satisfied in order to utilize this metric. Firstly, the tests to be compared must measure, at least approximately, if not actually, the same sets of skills. Several recent research efforts such as the Anchor Test Study (Loret, Seder, Bianchini, and Vale, 1972) indicate that the intercorrelations among the eight most widely used reading achievement tests generally register 0.95 or better. Another study (Roudabush, 1975) shows that these results extend to comparisons between criterion-referenced (CRT) and norm-referenced (NRT) tests; this research effort found the correlation between a CRT and NRT to be equivalent to that between the two alternate forms of the NRT.

The second assumption which must be made relates to the implications and "generalizability" of gains in achievement test scores. Any two tests which purportedly measure a specific ability such as reading comprehension do not necessarily contain essentially identical items or objectives. Nontheless, each test can be expected to contain a subset of items or objectives which do overlap with respect to the construct which they address. In order to use NCEs, an increase in the general ability measured by the two tests must be assumed to be directly indicated by the gain represented in any subset of items or objectives claiming to measure that general ability.

The metric proposed by various researchers as well as by USOE is the NCE. It is a simple, standardized transformation similar to both a Z-score and a T-score. The NCE is distributed normally about a mean of 50 with a standard deviation of 21.06. To convert a raw score to an NCE, a Z-score is obtained using the following formula:

$$Z = \frac{\chi - \mu}{\sigma}$$

where χ = observed or raw score;
μ = population mean; and
σ = population standard deviation.

The Z-score can then be easily transformed into an NCE by this operation:

$$NCE = (21.06)Z + 50$$

If the raw test scores can be translated into percentiles using appropriate tables supplied by the test publisher, then the NCEs representing the raw scores may easily be determined by using a conversion table of percentiles-to-NCEs such as Table B.1. There are also conversion tables available which list the NCE equivalent to every percentile ranging from 0.0 to 100.0 by increments of one tenth.

*This appendix draws heavily from "The Normal Curve Equivalent: A Metric to Measure Instructional Project Impact," by Alice Chiang and Larry D. Rosen.

Table B.1

Normal Curve Equivalent to Percentile Conversion Table

NCE	Percentile	NCE	Percentile	NCE	Percentile
1	1.0	36	25.3	71	84.1
2	1.1	37	26.8	72	85.2
3	1.3	38	28.4	73	86.3
4	1.4	39	30.1	74	87.3
5	1.6	40	31.7	75	88.2
6	1.8	41	33.5	76	89.2
7	2.1	42	35.2	77	90.0
8	2.3	43	37.0	78	90.8
9	2.6	44	38.8	79	91.6
10	2.9	45	40.6	80	92.3
11	3.2	46	42.5	81	92.9
12	3.6	47	44.3	82	93.6
13	2.9	48	46.2	83	94.1
14	4.4	49	48.1	84	94.7
15	4.8	50	50.0	85	95.2
16	5.3	51	51.9	86	95.6
17	5.9	52	53.8	87	96.1
18	6.4	53	55.7	88	96.4
19	7.1	54	57.5	89	96.8
20	7.7	55	59.4	90	97.1
21	8.4	56	61.2	91	97.4
22	9.2	57	63.0	92	97.7
23	10.0	58	64.8	93	97.9
24	10.8	59	66.5	94	98.2
25	11.8	60	68.3	95	98.4
26	12.7	61	69.9	96	98.6
27	13.7	62	71.6	97	98.7
28	14.8	63	73.2	98	98.9
29	15.9	64	74.7	99	99.0
30	1..1	65	76.2		
31	18.4	66	77.6		
32	19.6	67	79.0		
33	21.0	68	80.4		
34	22.4	69	81.6		
35	23.8	70	82.9		

Another method for translating percentiles to NCEs is to find the Z-score in a table (such as B.2) of the cumulative normal distribution for various standardized values. More extensive and precise tables can be found with numbers accurate to many decimal places; however, this table is suitable for the purposes of this discussion. A percentile is actually a decimal fraction with a base equal to 100. Hence, a percentile score of 24.2 percent is equivalent to 0.2420. Using a cumulative normal distribution table, we see that the area under the normal curve equal to 0.2420 corresponds to a -score of -0.70. This Z-score is then substituted in the previous formula to yield the NCE:

$$NCE = (21.06)(-0.70) + 50 = 35.3$$

Percentile scores can also be ascertained when NCEs are known. One method is to convert the NCE back to a Z-score using this formula:

$$Z = \frac{NCE - 50}{21.06}$$

The percentile equivalent to the NCE and Z-score may then be found by using a table containing normal standardized values or Z-scores and the cumulative area under the curve represented by each of these values (see Table B.2). To illustrate the usage of the Z-score table, assume that it is desirable to convert two NCEs—23.7 and 67.8—to percentiles. First, convert the NCEs to Z-scores:

$$Z_1 = \frac{23.7 - 50}{21.06} = \frac{-26.3}{21.06} = -1.25$$

$$Z_2 = \frac{67.8 - 50}{21.06} = \frac{17.8}{21.06} = 0.85$$

Next, the area under the curve for each Z-score is read from Table B.2; this area is equal to a percentile expressed as a decimal fraction. The area for Z_1 is 0.1056; for Z_2, 0.8023. This means that the NCE = 23.7 is equivalent to a percentile score of 10.56 percent; NCE = 67.8, to a percentile score of 80.23 percent. When greater precision is desired in the Z-score values, simply use a table with more precise values for Z.

Another way to determine the percentile score equivalent to an NCE is to use a conversion table for NCEs-to-percentiles such as Table B.3. More precise tables such as this are also available, with NCEs ranging from 1.0 to 99.0 in increments of one tenth.*

*For both precise conversion tables listing NCEs and percentiles, see Chiang and Rosen, in press, Appendices A and B.

Table B.2

Cumulative Normal Distribution

Z	Area	Z	Area	Z	Area
-3.25	.0006	-1.00	.1587	1.05	.8531
-3.20	.0007	- .95	.1711	1.10	.8643
-3.15	.0008	- .90	.1841	1.15	.8749
-3.10	.0010	- .85	.1977	1.20	.8849
-3.05	.0011	- .80	.2119	1.25	.8944
-3.00	.0013	- .75	.2266	1.30	.9032
-2.95	.0016	- .70	.2420	1.35	.9115
-2.90	.0019	- .65	.2578	1.40	.9192
-2.85	.0022	- .60	.2743	1.45	.9265
-2.80	.0026	- .55	.2912	1.50	.9332
-2.75	.0030	- .50	.3085	1.55	.9394
-2.70	.0035	- .45	.3264	1.60	.9452
-2.65	.0040	- .40	.3446	1.65	.9505
-2.60	.0047	- .35	.3632	1.70	.9554
-2.55	.0054	- .30	.3821	1.75	.9599
-2.50	.0062	- .25	.4013	1.80	.9641
-2.45	.0071	- .20	.4207	1.85	.9678
-2.40	.0082	- .15	.4404	1.90	.9713
-2.35	.0094	- .10	.4602	1.95	.9744
-2.30	.0107	- .05	.4801	2.00	.9772
-2.25	.0122			2.05	.9798
-2.20	.0139			2.10	.9821
-2.15	.0158	.00	.5000	2.15	.9842
-2.10	.0179			2.20	.9861
-2.05	.0202			2.25	.9878
-2.00	.0228	.05	.5199	2.30	.9893
-1.95	.0256	.10	.5398	2.35	.9906
-1.90	.0287	.15	.5596	2.40	.9918
-1.85	.0322	.20	.5793	2.45	.9929
-1.80	.0359	.25	.5987	2.50	.9938
-1.75	.0401	.30	.6179	2.55	.9946
-1.70	.0446	.35	.6378	2.60	.9953
-1.65	.0495	.40	.6554	2.65	.9960
-1.60	.0548	.45	.6736	2.70	.9965
-1.55	.0606	.50	.6915	2.75	.9970
-1.50	.0668	.55	.7088	2.80	.9974
-1.45	.0735	.60	.7257	2.85	.9978
-1.40	.0808	.65	.7422	2.90	.9981
-1.35	.0885	.70	.7580	2.95	.9984
-1.30	.0968	.75	.7734	3.00	.9987
1.25	.1056	.80	.7881	3.05	.9989
1.20	.1151	.85	.8023	3.10	.9990
1.15	.1251	.90	.8159	3.15	.9992
1.10	.1357	.95	.8289	3.20	.9993
1.05	.1469	1.00	.8413	3.25	.9994

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Table B.3

Percentile to Normal Curve Equivalent Conversion Table

Percentile	NCE	Percentile	NCE	Percentile	NCE
1	1.0	36	42.5	71	61.7
2	6.7	37	43.0	72	62.3
3	10.4	38	43.6	73	62.9
4	13.1	39	44.1	74	63.5
5	15.4	40	44.7	75	64.2
6	17.3	41	45.2	76	64.9
7	18.9	42	45.8	77	65.6
8	20.4	43	46.3	78	66.3
9	21.8	44	46.8	79	67.0
10	23.0	45	47.4	80	67.7
11	24.2	46	47.9	81	68.5
12	25.3	47	48.4	82	69.3
13	26.3	48	48.9	83	70.1
14	27.2	49	49.5	84	70.9
15	28.2	50	50.0	85	71.8
16	29.1	51	[illegible]	86	72.8
17	29.9	52	[illegible]	87	73.7
18	30.7	53	[illegible]	88	74.7
19	31.5	54	52.[illegible]	89	75.8
20	32.3	55	52.6	90	77.0
21	33.0	56	53.2	91	78.2
22	33.7	57	53.7	92	79.6
23	34.4	58	54.2	93	81.1
24	35.1	59	54.8	94	82.7
25	35.8	60	55.3	95	84.6
26	36.5	61	55.9	96	86.9
27	37.1	62	56.4	97	89.6
28	37.7	63	57.0	98	93.3
29	38.3	64	57.5	99	99.0
30	39.0	65	58.1		
31	39.6	66	58.7		
32	40.1	67	59.3		
33	40.7	68	59.9		
34	41.3	69	60.4		
35	41.9	70	61.0		

As Chiang and Rosen point out, whatever common metric is utilized by researchers evaluating data from numerous projects, it must possess four qualities:

- *Interpretability.* It must be meaningful and easily grasped by all groups of information users.
- *Sensitivity.* It should discriminate even small differences in pre-post scores.
- *Commonality.* The mean, variance, and distribution must be standardized across all tests.
- *Equal interval.* Any consecutive scale units should be an equal distance apart at any point on the continuum of the scale.

The NCE does enjoy all four of these characteristics. It is more interpretable than stanines and Z-scores; more sensitive than percentiles and stanines; is comparable across all tests, unlike grade equivalents and raw scores; and has an equal interval scale, unlike raw scores, grade equivalents, and percentiles.

In order to utilize NCEs appropriately, the researcher must never compare scores derived from tests which were normed on different populations. Fortunately, most widely used standardized achievement tests are normed on what may be called a "representative" sample of the national population. Hence, NCEs for these tests can probably be compared safely with little concern for the equivalence of the various norming samples. In fact, the Anchor Test Study (Loret et al., 1975) indicates that the normative samples from the national population used by major test publishers are similar.

When using tests normed on a national sample, the NCEs indicate achievement relative to the national norm. Similarly, when using tests normed on some local sample, NCEs actually describe differences in achievement as compared to the local median in terms of the local variance. However, "local" NCEs are not comparable to "national" NCEs, since they represent scores on tests using *different* norming populations.

NCE gain scores can be estimated from locally normed scores (for example, criterion-referenced test scores) and then used to compare with NCEs derived from nationally normed scores. The NCE gain is calculated using this formula (Chiang and Rosen, p.10):

$$NCE = 21.06 \frac{\bar{Y} - \hat{\bar{Y}}}{S_{LOCAL}} * \frac{S_{NRT}}{\sigma_{NRT}}$$

where $\bar{Y}$ = mean posttest score for treatment group;

$\hat{\bar{Y}}$ = mean posttest score for no-treatment or control group;

σ_{NRT} = national population standard deviation on a norm-referenced test, given in the test publisher's technical manual;

S_{NRT} = sample group's standard deviation on the same norm-referenced test; and

S_{LOCAL} = sample group's standard deviation on the locally normed test.

The basis for this equation requires the assumption that the ratio between the sample group variance and the national population variance on a norm-referenced test should be equivalent to the ratio between the sample group variance and the national population variance on a locally normed test. In addition, the correlation between the norm-referenced and the locally normed tests must be high, thereby indicating that they are measuring approximately the same thing. Current research (Roudabush, 1975) indicates that this procedure is at least reasonable.

APPENDIX C
ACHIEVEMENT SCORE DISTRIBUTIONS

PRETEST

In this section, the distributions of the percentages of students from the two groups over the range of possible pretest scores are examined, separately for each grade, in order to explore the extent and the impact of the differences between the pretest mean achievement score of the Title I and the non-Title I students. The distributions of the percentages of students in the Title I and non-Title I groups are presented for both reading and mathematics, and for grades 1 through 3, in Figures C-1 and C-2. The data points that are plotted on each of these graphs are listed in the appropriate columns of tables 6.5-6.10.

These figures indicate that the distributions of the Title I and the non-Title I students are highly similar at each grade and for each subject. The pattern of percentages, or relative numbers of students, at each of the possible pretest achievement scores are nearly the same for both groups at each grade and for both reading and mathematics. A student's chances, then, of having any particular pretest score are just about the same for both groups, when considered separately for each grade and subject. These figures reveal a general tendency for Title I students to have a slightly higher chance of being at the low end of the score distributions, and for non-Title I students to have a corresponding higher chance of being at the high end of the score distribution. There is no apparent and clearcut demarcation between the score ranges of the two groups.

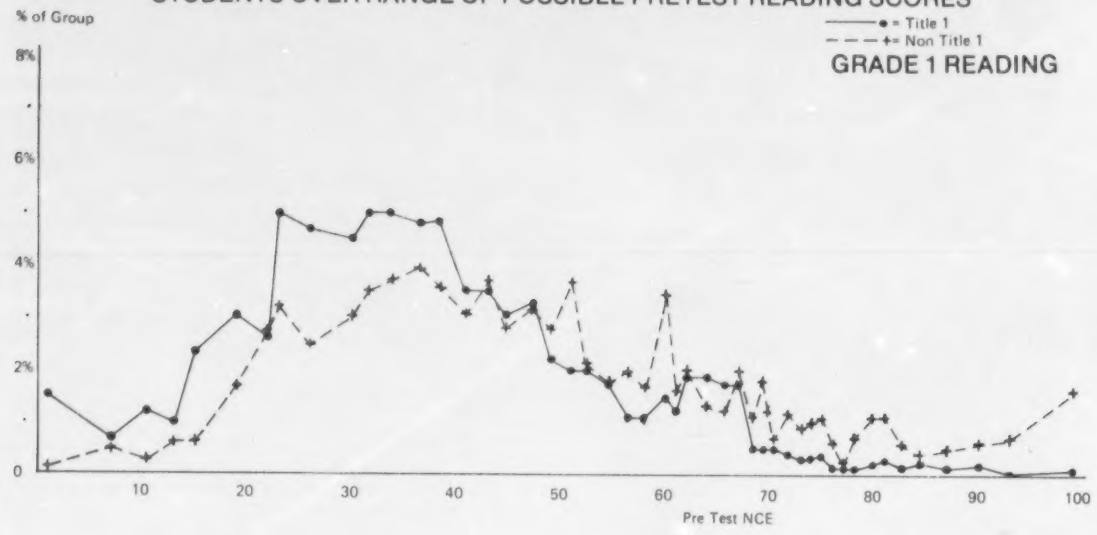
An inspection of the pretest score distributions for a sample of schools in the 1975-76 program indicated that between one-third and one-half of the Title I schools during that academic year had a clearcut threshold that separated the pretest score distributions for the Title I and the non-Title I students. Although there may be a clearcut threshold between the pretest score distributions of the Title I and the non-Title I students in up to one-half of the individual Title I schools, when the score distributions are examined for all of the Title I schools at once, there is no general demarcation between the score distributions of the two groups of students.

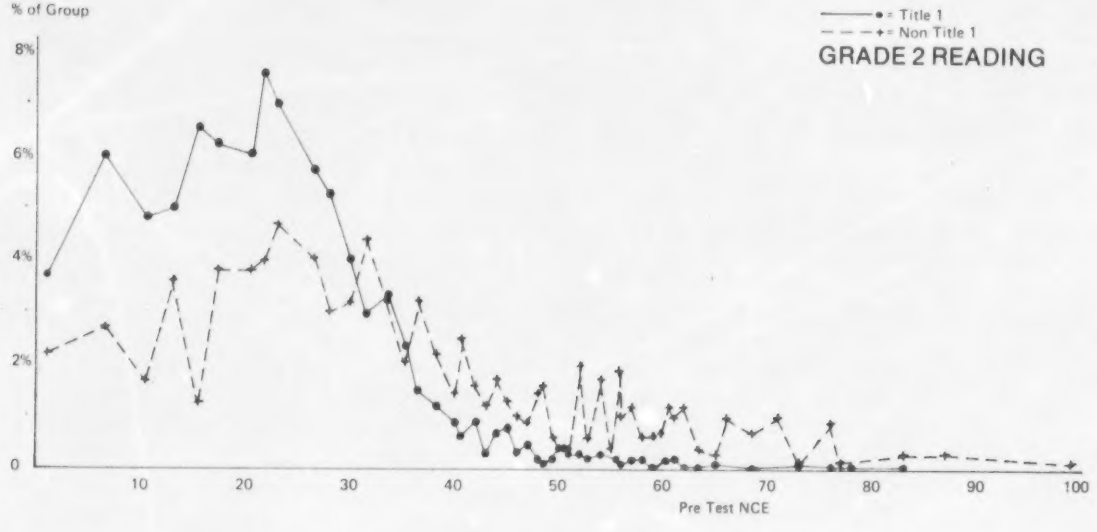
The score range where the pretest score distributions are concentrated is the second most noticeable aspect of Figures C-1 and C-2. The pretest score distributions for both Title I and non-Title I students are concentrated toward the low end of the score range, in both reading and mathematics, particularly for grades 2 and 3.

A feature of the pretest score distributions is the difference between the first grade distribution for both reading and mathematics, and the distributions for grades 2 and 3. The first grade distributions for both Title I and non-Title I students approach a bell shape, and the lowest few achievement scores are only slightly represented, for both reading and mathematics. The second and third grade distributions are concentrated at a lower level, and even the lowest achievement scores are well represented for both groups. This change from the first to the second and third grade distributions reflects the decrease over time of the general level of achievement scores, as discussed previously in the section on reading and mathematics achievement scores. This change in the pretest score distributions between the grade 1 pretest and the grade 2 pretest indicates that a disadvantage is experienced by the students during grade 1 and the subsequent summer. As a whole, both Title I and non-Title I students demonstrate a partial recovery from this loss after their entrance to grade 2.

Another aspect of the concentration of the pretest achievement score distributions in an area of low score levels is that there are large numbers of non-Title I students who have low pretest achievement scores. This situation is associated with the selection of students for program participation on the basis of criteria that do not reflect just the level of academic performance as measured by the achievement pretest. The complement of this situation is that Title I students have representation at some score levels above the 50th NCE point, and they also have some representation at all score levels between the 50th and the 99th NCE points.

FIGURE C-1 PERCENTAGE DISTRIBUTION OF TITLE I AND NON-TITLE I STUDENTS OVER RANGE OF POSSIBLE PRETEST READING SCORES





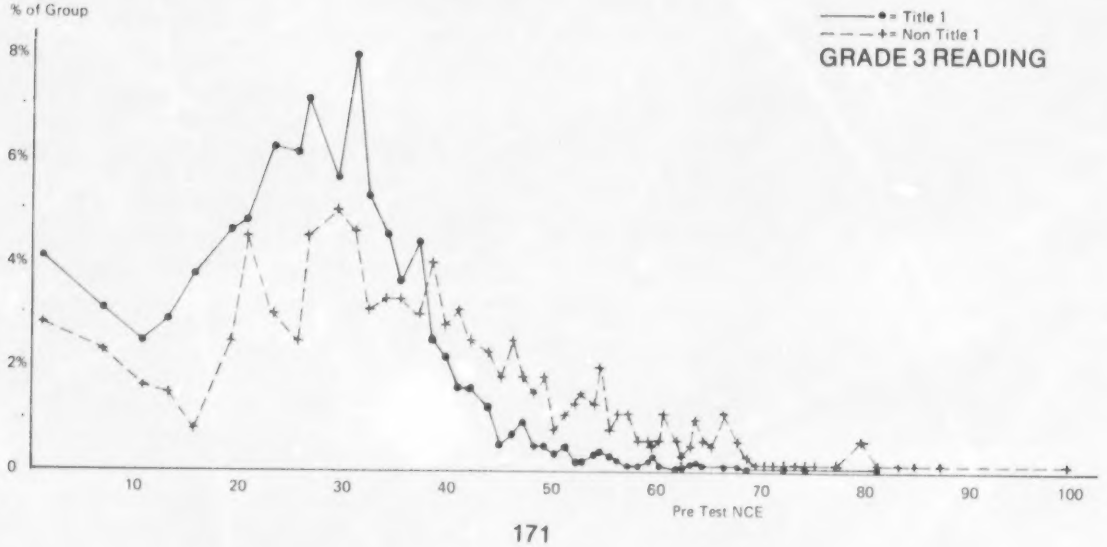


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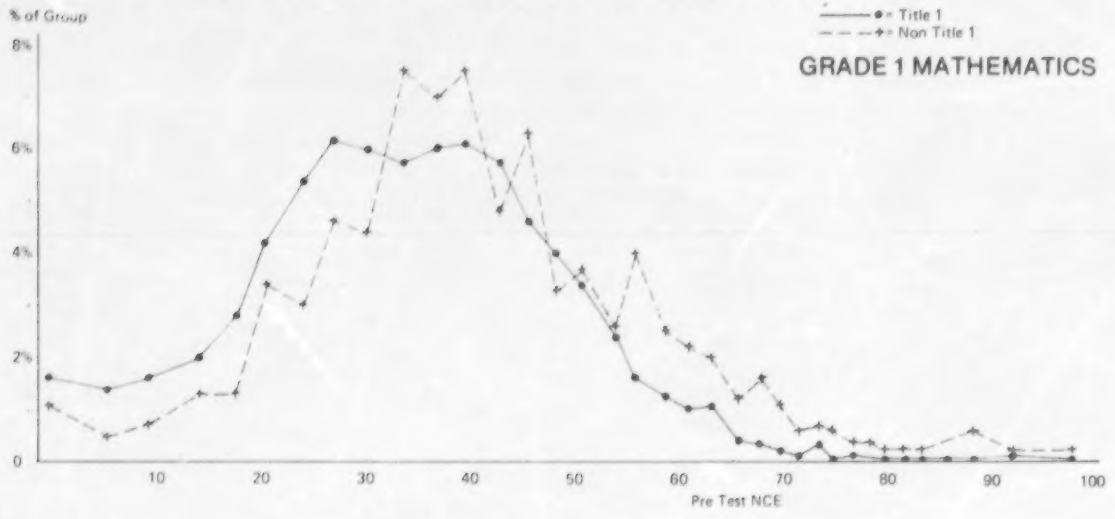
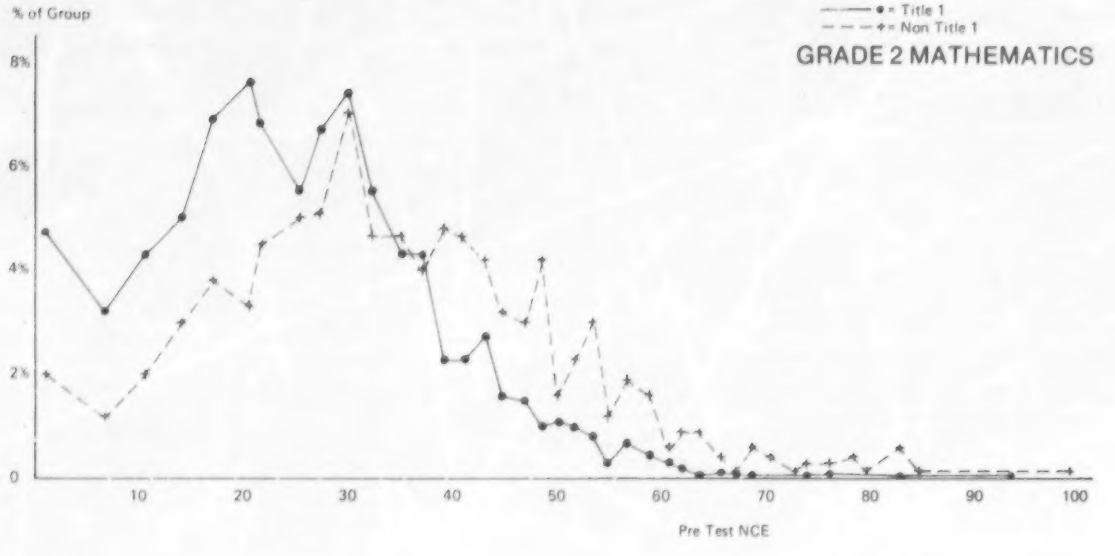
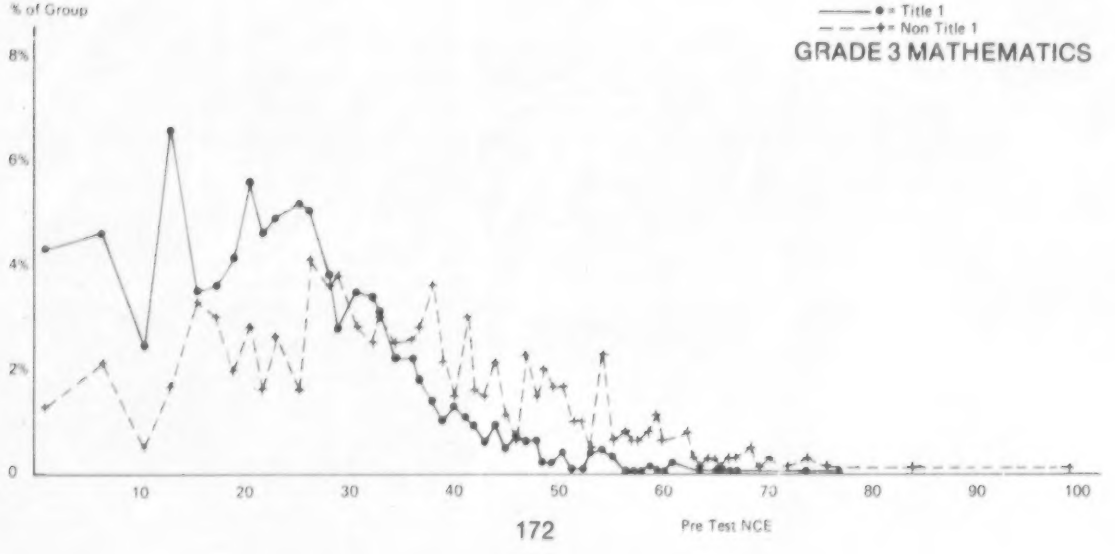
FIGURE C-2 PERCENTAGE DISTRIBUTION OF TITLE I AND NON-TITLE I STUDENTS OVER RANGE OF POSSIBLE PRETEST MATH SCORES







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POSTTEST

A regression curve is a graph of the dependent variable mean values as conditioned by the independent variable. Figures 6.14 and 6.15 present the regression curve of the posttest achievement scores as conditioned by the pretest achievement scores, separately for both Title I and non-Title I students, for both reading and mathematics, for grades 1-3. The data points that are plotted on these graphs are listed in the appropriate columns of the accompanying tables. Each figure that presents one of the regression curves of posttest achievement is shown directly below the figure which presents the asociated pretest population distributions. The last figure in each display is discussed in the next section.

These figures provide a comparison of Title I students with non-Title I students who have the same level of pretest achievement. At the lowest few possible pretest achievement score points, and at the highest one-fourth to one-half of the pretest achievement score range, there is a consistent pattern of instability in the relationship between the posttest achievement means for Title I and non-Title I students in both reading and mathematics, in all three grades. At the lowest few pretest achievement score points, the posttest means are confounded by the presence of unreliability in the test scores from this range, due to a degree of guessing. In the pretest achievement score range of from 40 to 70 NCE's, the posttest means are unstable because there are only a few students from either group who have pretest scores for each point in this range. The association of patterns of instability with small numbers of students at each score point at the upper end of the score range can be seen when the figures presenting the population distributions are compared with the figures presenting the mean posttest scores. There are, however, large numbers of students from each group who have pretest scores for each of the possible score values between an NCE of about ten and an NCE of from 40 to 70, depending upon the test and the grade. For these ranges of pretest scores, stable and reliable estimates can be obtained for mean posttest achievement scores for both Title I and non-Title I students, and comparisons can be made between the performance of the two groups at each pretest score value in these ranges.

The second major feature is clearly and consistently present over the pretest score range where the stable posttest mean scores are available. The mean posttest achievement scores for the Title I students at each separate pretest score in this range are almost always lower than the corresponding mean scores for the non-Title I students at the same pretest score level. This indicates that when the effects of differences in the level of pretest achievement scores are removed by empirically regressing the posttest achievement scores upon the pretest achievement scores separately for each group, then Title I students do not perform as well, on the average, as non-Title I students who have the same pretest score.

When these figures and data are examined in the pretest score range where the stable posttest mean scores are available, two main features are clear and consistent. First, the slope of all of the regression curves is not steep, which indicates that, overall, the correlation between the pretest and posttest scores is fairly low. A table of squared correlations (R^2) is presented in Tables 6.3 and 6.4. When the posttest achievement scores are regressed upon just the pretest achievement scores, the overall R^2 ranges from about $R^2 = .20$ to about $R^2 = .40$. This indicates that between 20 and 40 percent of the overall variation in the posttest scores is associated with pretest achievement scores. Conversely, 60 to 80 percent of the variation is associated with other factors besides the level of the pretest achievement score.

The problem remains to clearly identify which factors make a significant difference in the level of posttest achievement scores, and to assess the comparative significance of Title I program participation when it is considered as but one among several relevant factors that have significant impacts upon academic success.

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